

Completion Report 515 N. Peshtigo Court Chicago, Illinois









September 23, 2013¹

Ms. Verneta Simon US Environmental Protection Agency – Region 5 77 W. Jackson Blvd., SE-5J Chicago, Illinois 60604-3590

Subject: Completion Report for 515 N. Peshtigo Court, Chicago, Illinois, AECOM, Inc. Project

No. 60219374

Dear Ms. Simon:

The enclosed Completion Report is for the screening for and removal of radiologically-contaminated fill soil completed by AECOM Technical Services, Inc. at the above referenced property. The work was performed on behalf Related BIT 500 Lake Shore Owner, LLC. This document includes the changes and modification requested by the U.S. Environmental Protection Agency (USEPA) in their emails of August 9 and 21, 2013.

Should you have any questions, please contact us at 847-279-2500.

Regards,

AECOM Technical Services, Inc.

Brian R. Schmidt Project Scientist II Steve C. Kornder, Ph. D. Senior Geochemist

¹ The NAREL gamma spectroscopy lab results were received from the USEPA on November 21, 2013 and have been inserted into Appendix E.

AFFIDAVIT

Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Steven C. Kornder, Ph.D.

Here Komoler

Project Manager

Date: 11/21/13

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1.0 Introduction

AECOM developed this Completion Report to document the gamma surveying and removal of radiologically contaminated fill soil from the 515 N. Peshtigo Court (Site). The Site is located between East Grand Avenue and East Illinois Street (to the north and south, respectively) and North Peshtigo Court and North Lake Shore Drive (to the west and east, respectively) in Chicago, Illinois. The Site was formerly occupied by a single level parking lot. The development consists of a 45 story multi-use concrete high-rise building and a 10 story podium without basements. Ground floor level is slab on grade that accommodates a lobby, retail, mechanical, loading dock and parking entry. AECOM surveyed the Site for radiological contaminants and remediated as part of the redevelopment and construction of the commercial high rise tower.

AECOM conducted the work documented in this Completion Report was conducted in accordance with the procedures outlined in the Work Plan for Remediation of Radiologically-Contaminated Soil at 515 N. Peshtigo Court (Work Plan) prepared by AECOM and revised to include comments from the United States Environmental Protection Agency (USEPA) dated August 8, December 20, 2011 and February 24, 2012. A copy of the Administrative Settlement and Order on Consent for Removal Action (Docket No. V-W-11-C-976) (Consent Order) for the Site is included in Appendix A.

AECOM, on behalf of Related BIT 500 Lake Shore Owner LLC, requests the USEPA approve the Completion Report and issue a Notice of Completion for the 515 N. Peshtigo Court Site, confirming that (a) all identified radiologically contaminated materials with levels of radioactivity in excess of the cleanup threshold standards set forth in the Work Plan have been removed from the site as required by the Work Plan, (b) no further removal or cleanup action is required at this time with respect to the radiologically-contaminated materials on the 515 N. Peshtigo Court Site, and (c) all Work, as that term is defined in the Consent Order, has been fully performed in accordance with the terms of the Consent Order, with the exception of any continuing obligations required by the Consent Order. Since the entirety of the fill soil at the Site was not screened, Related BIT 500 Lake Shore Owner LLC will record an Environmental Covenant that complies with the Illinois Uniform Environmental Covenant Act, to ensure that any and all future intrusion into the unscreened fill soil will be conducted with appropriate radiological screening.

2.0 Background

2.1 Site Location

The Site is irregular in shape and encompasses approximately 0.90 acres. Prior to construction, it consisted of an asphalt-paved parking lot and decorative landscaping planters in the southwest portion of the Site. It is bounded by East Grand Avenue on the north, East Illinois Street on the south, Lake Shore Drive on the east and Peshtigo Court on the west (refer to Drawings 1&2). The Site is located in an area of reclaimed land where fill soil was placed along the Lake Michigan shoreline starting in the 1860's. This area of Chicago is commonly referred to as Streeterville. Recent developments in the Streeterville area of Chicago encountered radiologically-contaminated fill soil. These near surface fill soils are generally 8-12 feet thick and are primarily sandy urban fill that contains bricks, mortar, broken concrete, wood and cinders.

The radiologically-contaminated materials were originally generated as waste and spills from the former Lindsay Light thorium gas mantle production facilities that had used and produced thorium nitrate in its manufacturing process. These thorium byproduct materials have been incorporated into fill soil materials used throughout the Streeterville area. The manufacturing operations were located at 22 West Hubbard Street, 161 East Grand Avenue and 316 East Illinois Street in Chicago, Illinois. Lindsay Light conducted these manufacturing operations in Streeterville from the early 1900s through the early 1930s before moving to West Chicago, Illinois. The radiological contamination typically consists of elevated concentrations of thorium and associated decay products in the fill soils in the vicinity of the former Lindsay Light sites. Cleanup of radiologically-contaminated fill soil has been performed at a number of Streeterville properties under the direction of USEPA.

Due to the proximity of this property to the manufacturing sites and documented cleanups at other properties in the Streeterville area, the USEPA, which has oversight authority for radiologically-contaminated sites, requires that radiological surveys be completed prior to and during site development within the moratorium area designated by the City of Chicago as the Streeterville Thorium Investigation Area.

2.2 Site History

The Site was formerly occupied by a parking lot, which encompassed the majority of the Site. According to a Phase I completed in October of 2010 by Pioneer Engineering and Environmental Services, Inc., (Pioneer), the Site was initially used as a lumber yard with small offices and sheds located on the property beginning in the early 1900's. At that time railroad tracks also ran through the property. By 1939 the property was apparently converted to a parking lot. In 1950, part of the property was jointly occupied by a small fueling station owned by Pure Oil Co. The previous history of the Site does not indicate that significant subsurface basement foundations were installed within the property boundary.

2.3 Radiological Survey Results

2.3.1 Initial Walk-Over Survey

In November 2000, AECOM (formerly STS Consultants Ltd.) conducted a walk-over radiation survey of the Site. AECOM submitted a report to the USEPA entitled "Radiation Survey of Three Parking Lots in the Vicinity of the Former Kraft Building" (Appendix B) summarized surveying activities conducted on three lots (Parcel 4, Parcel 21 and Parcel 24). The report indicated that during the walkover gamma radiation survey no indication of radiologically-contaminated fill soil was evident on Parcel 24 (the Site).

2.3.2 Down-hole and Test Pit Survey Results

In October 2007, Pioneer performed test pitting operations at three locations on the Site. As summarized in an October 12, 2007 letter from RSSI, the results of each test pit resulted in finding no indication of radiologically-contaminated fill soil in each of the three areas excavated.

Between August 11 and October 14, 2008, Pioneer assisted RSSI in the collection of soil samples for gamma spectroscopy analysis and the real-time data collection of down-hole radiation surveys (refer to Appendix B). The down-hole gamma data was collected at one foot intervals in a total of 22 borings to a maximum depth of 10-feet below surface grade (ft-bgs). Instrumentation used for the down-hole investigation by RSSI was reported to have a response of 16,500 counts per minute (cpm) which was equivalent to background plus 5 picocuries per gram (pCi/g) or approximately the USEPA cleanup threshold. While a majority of the down-hole gamma readings were below the field instrumentation threshold of 16,500 cpm, the down-hole data indicated elevated gamma readings above the instrument threshold in a 3-4 feet thick layer that generally occurred 2-6 feet below the paved surface. Since these elevated gamma readings could potentially indicate radiologically-contaminated material greater than the USEPA cleanup threshold of 7.1 pCi/g, soil samples were collected and analyzed for radioactive isotopes. Soil samples were collected at 20 of the 22 borings and generally from the depth with the highest gamma readings. These analytical results did not exceed the 7.1 pCi/g USEPA cleanup threshold. Thus, based on the gamma measurements, the potential for radiologically-contaminated fill soil existed even though the soil sample analyses did not confirm the presence of radiologically-contaminated fill soil.

On June 29, 2011, Pioneer installed a series of seven shallow geoprobe borings to collect soil samples to assess the Site for petroleum related contamination. This investigation was used as another opportunity to collect down-hole data. A geoprobe rig was used to collect the soil samples and install a 1-inch temporary casing which was used to collect down-hole gamma readings at 1-foot intervals. This study conducted by AECOM utilized a ½ X 1 inch Sodium lodide (NaI) probe instead of the 2 X 2 inch NaI probe used by RSSI because of the smaller diameter of the geoprobe borings. Thus, for this probe configuration the gamma count equivalent to the USEPA cleanup threshold is approximately 3,491 cpm. The down-hole gamma results of the June 29, 2011 investigation and a drawing by Pioneer with the boring locations is included at the end of Appendix B. This drawing also includes the location of the 2008 investigation.

The June 2011 results did not indicate gamma readings that were indicative of radiologically-contaminated fill soil above the USEPA cleanup threshold of 7.1 pCi/g. However, USEPA generally considers gamma readings greater than twice background as potentially anomalous results. For the June 2011 investigation, twice background was estimated to be about 2,400 cpm. A review of the results indicates that four gamma readings exceeded two times background. Thus, although no gamma readings greater than the instrument threshold were encountered, several slightly elevated and/or anomalous gamma results were observed. Screening of the spoil generated during the boring process and the down-hole monitoring revealed no indication of soils above the specified clean-up threshold established by the USEPA for the Streeterville area of Chicago. Table 1 of the report in Appendix B presents a summary of the down-hole gamma readings observed for each boring during the survey.

3.0 Radiological Surveying and Removal Activities

Field activities included the investigation and removal of the radiologically-contaminated fill soil identified during surveying of construction related work. Specifically, this work included surface surveys, pot-holing and survey for caissons and grade beams, site-grading activities and utility installation work (both on-site and within the rights-of-way). The remaining sections of this report document the radiological surveying activities and the removal actions conducted as outlined in the Work Plan. The Work Plan and construction related activities covered by this report were performed between August 2011 and April 2013.

3.1 Site Work Documented Through Progress Reports

The work completed in the course of this report was documented through monthly progress reports and emails submitted to USEPA. These progress reports described the work completed each month, and described the work planned for the upcoming month. The soil analyses for the verification samples were submitted with the request for USEPA sign-off of successful remediation and therefore were not included with the monthly progress reports. The monthly reports are on file with USEPA and therefore are not included as an attachment in this Completion Report.

3.2 USEPA Cleanup Level

The cleanup limit established for Chicago's Streeterville area by USEPA is 5 pCi/g of total radium (Ra-226 + Ra-228) above the background radium activity. The background total radium activity for Streeterville is specified by USEPA as 2.1 pCi/g. Thus, the USEPA cleanup threshold for the Site was established at 7.1 pCi/g total radium.

Gamma radiation count measurements for the project were generally made using a Ludlum Model 2221 survey meter and an unshielded 2 x 2 inch Nal probe Model 44-10. During the surveys, the instrument probe was positioned as close as possible to the ground surface and generally about two inches above the ground. During the course of the investigation, the Ludlum Model survey meter was re-calibrated annually. Instrument calibration data are provided in Appendix I².

3.3 Safety Training and Communications

Site and project specific radiation and health and safety training was provided to the on-site personnel prior to the start of remediation work on the Site. Training included discussion of radiation basics, anticipated hazards, equipment to be worn, safety practices to be followed, contamination prevention practices, and emergency procedures as well as a discussion of the site-specific HASP. Project manager Steve Kornder (AECOM) and health physicist Glenn Huber (Stan A. Huber Consultants, Inc. - SAHCI) conducted the training. A copy of the training attendance sheet is included in Appendix J.

² Ludlum Model 2221 field instruments cutoff values equivalent to the 7.1 pCi/g USEPA cleanup threshold differ slightly between meters and change with each annual calibration. For the field instrument utilized the gamma count equivalent to the 7.1 pCi/g threshold value referenced in the report changed with the annual calibration. Specifically, the cutoff value for August 2011 to October 2011 was 18,617 counts per minute (cpm) unshielded, for November 2011 through October 2012 it was 19,969 cpm unshielded and for November 2012 through April 2013 the equivalent gamma count was 17,920 cpm unshielded.

3.4 Gamma Surveying During Construction Activities

3.4.1 Walk-Over Survey

Construction related radiological screening was initiated on August 19, 2011 with excavation of two test pits, which was immediately followed by asphalt removal. The initial activities involved excavating two test pits in the vicinity of two borings from the 2008 down-hole gamma investigation that exhibited the elevated gamma readings. The test pits were excavated in the vicinity borings B-18 and B-17 (see Pioneer drawing in Appendix B). No elevated gamma readings indicative of radiologically-observed soil above the USEPA threshold were encountered in these test pits. In the vicinity of boring B-18 it was apparent that a layer of granite pavers were causing high gamma readings, while at boring B-17 no elevated gamma readings were observed during the testing and screening effort. Therefore, based on the observations from the test pitting effort, it is believed that some of the elevated gamma readings observed in the down-hole investigation may be attributable to a layer of granite pavers buried about 3-4 feet below the paved surface. The pavers consistently generated shielded gamma readings of above 8,000 cpm versus a shielded cutoff of approximately 6,700 cpm. Thus, the screening of the test pit soils did not confirm the elevated gamma readings observed in the down-hole survey as being necessarily associated with thorium contaminated fill soil.

Immediately following the test pitting effort on August 19, 2011 the stripping of asphalt and grading of the site was initiated. The primary goal was to create a level site for the installation of caissons. This generally consisted of the re-grading (moving) of material from the western/southwestern portions of the Site and placement of this soil in the eastern and northeastern portion of the site. Gamma surveys were conducted as the asphalt was removed and subsequent surveys of the fill soil below the asphalt were completed in 18-inch lifts. No elevated gamma readings indicative of radiologically-contaminated soil were observed during the grading survey.

3.4.2 Caisson Pot-holing Surveying

Construction activities for the new building began with pot-holing at the proposed caisson locations. Excavation test pits were initiated on August 22 and completed on August 30, 2011. Radiological caisson pre-screening activities were performed at locations where soil remediation and/or surveying to the native sand had not occurred previously. The pot-holing excavations (about 8 x 10 foot) were excavated with an excavator in 18-inch lifts at proposed caisson installation locations (refer to Figure 3). AECOM personnel screened the fill soil using a Ludlum 2221 meter and 2 x 2 inch Nal probe. The primary purpose of the test pitting activity was to remove any obstructions that could potentially interfere with the installation of the caissons. However, the pot-holing also allowed the fill soil at caisson locations to be pre-screened for the potential presence of radiologically-contaminated fill soil. Thus, the screening during pot-holing eliminated the need to conduct screening during the actual caisson installation. The thickness of the fill soil at the Site was approximately 11-12 feet. Groundwater was also encountered at the Site at approximately the same depth (i.e., 0-feet Chicago City Datum - CCD).

On August 29, 2011, elevated gamma readings were recorded about two feet below the asphalt pavement (9.75 ft CCD) at caisson location I-3.5 (Figure 1). Gamma readings (unshielded) at about 3 ft-bgs (8.75 ft CCD) reached a maximum of about 41,000 counts per minute - cpm (versus the USEPA cleanup threshold of 18,617 cpm). The following day (August 30, 2011) a second area with elevated gamma readings was observed at caisson location I-1.9. Gamma readings (unshielded) for I-1.9 at about 3 ft-bgs (8.75 ft CCD) had a maximum of about 95,000 cpm (versus the field instrument cutoff of 18,617 cpm). The caisson locations on either side of this location did not exhibit elevated readings (I-1 and I-2.8). Excavation at the both locations was halted and an exclusion zone was established around each area. USEPA visited the site and a sample was collected and analyzed from I-1.9. This sample indicated a total radium activity of 76 pCi/g (refer to Appendix C-1). Both areas were remediated between September 12-14, 2011 and additional remediation was conducted at I-1.9 in December 2011, Successful verification sampling forms were signed for both exclusion zones on September 15, 2011 and a second successful verification at the southern edge of I-1.9 along the sidewalk was signed on December 6, 2011 (refer to Section 3.5). No other elevated

gamma readings indicative of radiologically-contaminated fill were observed at any other caisson test pit location.

Survey values for all remaining caisson pot-holing excavations were below remediation action levels. Survey values for these caisson excavations ranged from a low of 6,100 cpm to a high of 16,900 cpm, with average readings ranging between 11,000-14,000 cpm. No other elevated gamma readings indicative of radiologically-contaminated fill soil were observed at the other caisson locations.

3.4.3 Sheet Pile Installation

3.4.3.1 Tower Core Surveying

In early October, radiological screening continued essentially on a daily basis wherever construction activities disturbed previously unsurveyed subsurface fill soil. The screening activities included sheeting operations along the southern property boundary and sheeting and soil excavation for the building core. Construction activities for the installation of sheeting/shoring within the tower footprint began on October 6, 2011. The sheet-pile wall was installed along the perimeter of the tower footprint (approximately 89 feet long by 74 feet wide) to provide stabilization for the elevator pit and other foundation structures installed during construction of the basement foundation (refer to Figure 2). In general, a shallow trench approximately five feet wide was excavated to approximately +6.75-feet CCD. The sheeting was placed within the trench and driven to the desired depth. The excavation for the sheet-pile was performed using a pile driver and was necessary to identify and remove potential obstructions that would prevent driving the sheeting.

Measurements of the sheet-pile trench excavations for the building core indicated gamma readings that ranged from 10,200 to 16,700 cpm. These readings are below the unshielded Ludlum threshold value of 18,617 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. The fill soil encountered during excavation consisted of brown to black colored sand to gravel size material with cinders, ash and brick/concrete debris. No indications of radiologically-contaminated fill above the USEPA clean threshold were observed.

Between October 12-21, 2011, excavation activities down to native sand began within the sheeting/shoring of the tower (core) footprint (refer to Figure 2). Fill soils within the tower footprint were surveyed down to native sand (0-feet CCD) in 18-inch lift intervals. From depths between 11.75 to 6.75-feet CCD, gamma readings ranged typically within the 9,000-12,000 cpm range with a maximum gamma value encountered of 13,600 cpm. From depths between 6.75 to 0-feet CCD, gamma readings ranged typically within the 11,000-14,000 cpm range with a maximum gamma value encountered of 15,400 cpm. The fill soil encountered during excavation consisted of brown to black colored sand to gravel size material with cinders, ash and brick/concrete debris.

3.4.3.2 E. Illinois Property Boundary

On October 11, 2011, construction activities were completed for the installation of sheeting/shoring just inside (north) of the sidewalk along the southern property line in order to allow the installation of grade beams (refer to Figure 2). In general, a shallow trench approximately five feet wide was excavated to a depth of approximately 7.75-feet CCD. The sheeting was placed within the trench and driven to the desired depth. The excavation for the sheet-pile was performed using a pile driver and was necessary to identify and remove potential obstructions that would prevent driving the sheeting.

An area of elevated gamma readings remained along the southern property line from an earlier remediation effort near caisson I-1.9. The area along the property boundary remained contaminated after the September remediation effort due to the absence of shoring necessary to prevent undermining the bordering sidewalk. The area of contamination was covered in plastic sheeting and plywood. This contaminated area was just outside (south) of the area that needed to be excavated to install the sheet-pile wall. Thus, elevated gamma readings were not encountered during the sheeting installation. Measurements of the sheet-pile trench excavations indicated gamma readings that ranged from 11,400 to 15,800 counts per minute (cpm). These readings are below the unshielded Ludlum threshold value of

18,617 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. As a result, no elevated gamma readings indicative of radiologically-contaminated fill soil were observed during the installation of the sheeting/shoring along the southern boundary of the Site.

3.4.4 Grade Beam Survey

Grade beam pot-holing activities began on October 21, 2011, and continued on at various points through December 7, 2011. Trenches excavated were approximately 5-feet wide with varying depths between 7.75 and 0.75-feet CCD. The varying intervals of grade beam construction depths were dependent on two factors: the difference in height in the original sloping site grade as well as differing construction specifications of each grade beam (refer to Figure 3). Grade beam trenches were excavated with a backhoe in 18-inch lifts at each of the grade beam locations. Radiological screening activities were performed at locations where soil remediation and/or surveying to the native sand had not previously occurred.

On November 21, 2011, a 10-foot wide by 2-foot thick area along the lower wall of the grade beam trench between caisson locations A-2 and B-2 (refer to Figure 1) was identified as containing elevated gamma readings of 104,000 cpm. An exclusion zone was established in that area and was remediated on December 6, 2011. Survey values for the remaining grade beam installations below remediation action levels, ranged from a low of 6,500 to a high of 17,100 cpm, with typical average readings falling between 12,000-15,000 cpm. No other elevated gamma readings indicative of radiologically-contaminated fill were observed at the other grade beam locations.

3.4.5 Crane Pad Survey

On October 10, 2011, surveying activities commenced for the excavation of a crane pad. A crane pad is a concrete slab installed below ground surface in order to provide support of the tower crane used during construction activities. A 31-foot wide by 24-foot long excavation was performed adjacent to the southwest corner of the tower core excavation (refer to Figure 2). Fill soil within the crane pad excavation was surveyed in 18-inch lift intervals down to a depth of approximately 0.75-feet CCD. From depths between 11.75 and 0.75-feet CCD, gamma readings typically ranged within 12,100-13,400 cpm with a maximum gamma reading encountered of 14,100 cpm. These gamma readings were below the unshielded Ludlum threshold value of 18,617 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. The fill soil encountered during excavation consisted of brown to black colored sand to gravel size material with cinders, ash and brick/concrete debris.

A 3-foot wide trench was excavated on October 12, 2011, to supply power for the crane from the electrical transformer pad in the northwest corner of the site to the crane pad. The trench spanned the length of the northern half of the Site and was excavated to a depth of approximately 6.75-feet CCD (refer to Figure 2). Survey values ranged from 13,200 to 16,100 cpm for the majority of the excavation. A 3-foot wide area along the excavation wall contained an elevated reading of 112,000 cpm between caissons D-1, D-2, E-1 and E-2 (refer to Figure 1). An exclusion zone was established for the area, which was remediated on December 5, 2011. Spoils from the trench did not exhibit elevated gamma readings nor were they noted at the surface in the vicinity of this area. No other elevated gamma readings indicative of radiologically-contaminated fill were observed within the electrical trench.

3.4.6 Retaining Wall Survey

On November 11, 2011, radiological surveying for an excavation of a retaining wall in the southwest corner of the site commenced. Fill soils within the 10-foot wide retaining wall excavation trench were surveyed in 18-inch lift intervals down to a depth of approximately 5.75-feet CCD. The retaining wall was installed to segregate the parking garage with a commercial store-front (refer to Figure 2). Measurements of the retaining wall trench excavation indicated gamma readings that ranged from 11,900 to 16,800 counts per minute (cpm). These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. As a result, no elevated gamma readings indicative of radiologically-contaminated fill soil were observed within the retaining wall trench.

3.4.7 Garage Site Grading Activities

After grade beam installations were completed, the area of the parking garage footprint was graded down to a depth of approximately 6.75-feet CCD (See Figure 2). The area was graded in order to allow installation of underground plumbing and electrical services and to accommodate the final plans for installation of a floor-slab. Fill soils excavated during grading operations were surveyed in 18-inch lift intervals down to final depth.

During grading operations on November 17, 2011, a 33-foot long by 34-foot wide approximate area of elevated gamma readings was discovered in a location between caissons F-4.4 and I-4.4. The area of elevated gamma readings was identified at a depth between 6.75 to 4.75-feet CCD (refer to Figure 1). An exclusion zone was established for the area. The area was remediated over a two-day effort on November 22 and 29, 2011. Survey values for the remaining grading activities in the parking garage footprint were below remediation action levels. The values ranged from a low of 9,100 to a high of 17,500 cpm, with typical average readings falling between 13,000-15,000 cpm. The fill soil encountered during excavation consisted of brown to black colored sand to gravel size material with cinders, ash and brick/concrete debris. No other elevated gamma readings indicative of radiologically-contaminated fill were observed during the grading conducted in the parking garage footprint.

3.4.8 Surveys for On-site Utility Installations

Between the days of November 11, 2011 through February 2, 2012 plumbing utility installation excavations were performed within the property boundary of the Site. The various plumbing installations consisted of storm/sanitary sewer lines, drain tiles and water service lines. Gamma readings measured within the plumbing excavations had wide ranging values due to the number of trenches and spatial distribution of the trench locations across the Site. Observed gamma readings ranged between 8,800 to 16,000 cpm with a maximum reading of 17,200 cpm. These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. As such, no elevated gamma readings indicative of radiologically-contaminated fill were observed at these utility excavation locations.

Figure 4 is provided to show the locations for the plumbing utility installation trenches. AECOM personnel were onsite to perform radiological surveys on all plumbing excavations during the project. A large storm water retention system and the associated plumbing were installed on the northwest, north and northeast corners of the Site (refer to yellow shaded areas on Figure 4). The storm water system excavation in the northwest corner of the site measured approximately 8-feet wide by 62-feet long. Fill soil within the northwest storm system excavation was surveyed in 18-inch lift intervals down to a depth of approximately 3.75-feet CCD. Gamma readings observed within the excavation performed during December 12-13, 2011, ranged between 10,700 to 14,400 cpm with a maximum reading of 15,800 cpm. These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium.

The storm water system excavation in the northeast corner of the Site was performed over a two-day period between November 30 and December 1, 2011. The storm water retention excavation in the northeast corner of the site measured approximately 30-feet wide by 83-feet long. Fill soil within the northeast storm trap excavation was surveyed in 18-inch lift intervals down to a depth of approximately 3.75-feet CCD. Radiological survey values found within the excavation, ranged between 11,200 and 14,900 cpm with a maximum reading of 15,200 cpm. No elevated gamma readings indicative of radiologically-contaminated fill were observed at either storm water retention system excavation location.

The northeast and northwest storm water retention systems were connected together by a 48-inch storm drain pipe that was installed adjacent to the northern most grade beam of the Site between caissons A-1 and A-7 (refer to yellow shaded areas on Figure 4). The dimensions of the storm drain pipe excavation were approximately 8-feet wide by 145-feet long. Fill soil within the storm drain pipe excavation was

surveyed in 18-inch lift intervals down to a depth of approximately 3.75-feet CCD. Radiological survey values found within the excavation ranged between 12,700 14,200 cpm with a maximum reading of 16,100 cpm. These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. As a result, no elevated gamma readings indicative of radiologically-contaminated fill were observed at the storm drain pipe excavation location.

The parking garage location was previously graded down to a level of 6.75-feet CCD (beneath the proposed floor slab elevation) to accommodate plumbing utility installations. As a result, various trenches approximately 3-feet wide to a depth of 4.75-feet CCD were excavated. No elevated gamma readings were observed during the excavation.

On November 14, 2011, an excavation for the installation of a grease trap on the east side of the Site was surveyed (refer to Figure 4). The grease trap excavation measured approximately 10-feet long by 6-feet wide. Fill soil within the grease trap excavation was surveyed in 18-inch lift intervals down to a depth of approximately 2.75-feet CCD. Gamma readings measured within the excavation ranged between 11,500 and 13,300 cpm with a maximum reading of 13,800 cpm. These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. As a result, no elevated gamma readings indicative of radiologically-contaminated fill soil were observed at the grease trap excavation location.

Between the days of November 23, 2011 and January 4, 2012, electrical conduits were installed at various locations throughout the eastern half of the Site. A 4-foot wide excavation trench running adjacent along the entire eastern property boundary of the site was excavated between November 23 and 25, 2011. The electrical conduits were installed to provide service lines reaching both the tower and parking garage areas. Fill soil within the eastern electrical conduit excavation was surveyed in 18-inch lift intervals down to a depth of approximately 2.75-feet CCD. Radiological survey values found within the excavation, ranged between 8,900 cpm to 15,600 cpm with a maximum reading of 16,500 cpm. No gamma readings indicative of radiologically-contaminated fill soil were observed at the eastern electrical conduit excavation location.

Between December 7 and 15, 2011, an excavation trench for an electrical service conduit into the tower was surveyed. An 8-foot wide trench spanning from the tower core near caisson D-5 to a connection with the eastern electrical service trench located near caisson E-8 was excavated to a depth of 1.75-feet CCD. The radiological survey values ranged from a low of 10,200 cpm to a high of 15,100 cpm, with typical average readings falling between 12,000 and 14,000 cpm. No gamma readings indicative of radiologically-contaminated fill were observed at the tower service electrical conduit trench location.

On January 4, 2012 AECOM personnel surveyed a 3-foot wide excavation for the installation of an electrical conduit spanning from the tower footprint (located near caisson D-6) to the future storefront location in the southwest corner of the site. The trench was excavated to a depth of 4.75-feet CCD. Radiological survey values ranged from a low of 9,900 cpm to a high of 13,700 cpm, with typical average readings falling between 11,000 and 12,000 cpm. No gamma readings indicative of radiologically-contaminated fill soil were observed at the storefront service electrical conduit trench location.

3.4.9 Surveys for Rights-of-Way Utility Installations

Between October 11 and 25, 2011, surveying activities for installation of sewer and water utilities were initiated in the Rights-of-Way (ROW) on East Illinois Street near the southeast property boundary. Construction required the installation of two sewer (storm and sanitary) service lines within the ROW. As a result, the two 30-foot long, 4-feet wide trenches were excavated to a depth of 2.75-feet CCD near the southeast corner of the site during installation (refer to Appendix K). Throughout the excavation, gamma readings ranged between 5,600 and 10,100 cpm. These readings are below the unshielded Ludlum threshold value of 18,617 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. No gamma readings indicative of radiologically-contaminated fill soil were encountered.

On October 31, 2011, excavation for the connection to the water service main under the existing sidewalk of Illinois Street was conducted. This excavation was between the two sewer excavations along the southern property line in the southeast corner of the Site (refer to Appendix K). An excavation approximately 29-feet long by 14-feet wide was excavated to a depth of approximately 4.25-feet CCD underneath the sidewalk of East Illinois Street near the southeast property line of the Site. Gamma readings of the excavation ranged from 5,200-10,800 cpm with a maximum gamma reading of 11,200 cpm. These readings are below the unshielded Ludlum threshold value of 18,617 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. No elevated gamma readings indicative of radiologically-contaminated fill soil were encountered.

On November 15, 2011, surveying activities for installation of gas service utilities were initiated in the ROW on East Illinois near the southeast property boundary. The trench previously excavated for the installation of a sewer service line was also partially used to install the majority of the gas service line. An additional 18-foot long by 2-foot wide trench (to a depth of approximately 7.75-feet CCD) was excavated directly south of the previous sewer trench in order to reach the existing gas main connection (refer to Appendix K). Throughout the excavation gamma readings ranged between 11,900 and 12,800 cpm with a maximum gamma reading of 14,500 cpm, which are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. Thus, no gamma readings indicative of radiologically-contaminated fill soil were encountered.

Between January 30, 2012 and February 2, 2012, surveying activities for installation of Com Ed electrical service utilities were initiated within the ROW of North Lake Shore Dr. near the northeast property boundary. Construction required the connection of a ComEd electrical main to an existing on-site electrical service package previously installed during construction activities. A 26-foot long by 3-foot wide trench was excavated to a depth of approximately 7.45-feet CCD in order to reach the existing electrical connection within the property (refer Appendix K). Gamma readings ranged between 5,100 and 11,200 cpm with a maximum gamma reading of 12,000 cpm. The readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. Thus, no elevated gamma readings indicative of radiologically-contaminated fill soil were encountered.

Between March 21and 27, 2012, surveying activities for relocation/installation of Chicago Department of Transportation (CDOT) utilities were initiated within the ROW of N. Peshtigo Ct. near the southwest property boundary. Construction required the connection of an existing City Of Chicago electrical main within the Right of Way (ROW) to an existing on-site electrical service package previously installed during construction activities. A 50-foot long by 2-foot wide trench (to a depth of approximately 7.45-feet CCD) was excavated within N. Peshtigo Ct. in order to reach the existing electrical connection (refer to Appendix K). Throughout the excavation, gamma readings ranged between 10,100 and 17,600 cpm with a maximum gamma reading of 17,600 cpm. These readings are below the unshielded Ludlum threshold value of 19,969 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. Thus, no elevated gamma readings indicative of radiologically-contaminated fill soil were encountered.

Between March 1 and April 4, 2013, surveying activities for installation of new sidewalks, street curbs and planter boxes were initiated within the existing sidewalk locations around the perimeter of the entire property boundary. Construction required the removal of the existing sidewalk and curb concrete and replacement with new sidewalk within the ROW. During the sidewalk and street curb replacement process, no additional soil from beneath the existing sidewalk was removed (refer to Appendix K). Throughout the sidewalk installation operations, gamma readings ranged between 7,100 and 9,800 cpm. These readings are the unshielded Ludlum threshold value of 17,920 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. Thus, no elevated gamma readings indicative of radiologically-contaminated fill soil were encountered.

Tree planter boxes were installed within the sidewalk areas along Illinois St. and Peshtigo Ct (refer to Figure 4). The planter boxes measured approximately 4-feet long by 4-feet wide (to a depth of approximately 36-inches below ground surface). Throughout the planter box installation operations, gamma readings ranged between 8,400 and 10,900 cpm. These readings are below the unshielded Ludlum threshold value of

17,920 cpm that is equivalent to the USEPA cleanup value of 7.1 pCi/g total radium. Thus, no elevated gamma readings indicative of radiologically-contaminated fill soil were encountered.

3.5 Removal of Radiologically-contaminated Fill Soils

The on-site excavation of the radiologically-contaminated fill soil was completed during two different phases. The first remediation activity was initiated on September 12, 2011 and the second remediation activity was initiated on November 22, 2011. Radiologically-contaminated fill soil was loaded directly into bulk material bags (super-sacks). Due to availability, two different sized super-sacks were utilized with 1-cubic yard and 3.5-cubic yard volumes. Remediation activities were performed at five excavation locations containing radiologically-contaminated fill soil on the western half of the Site. Figure 1 shows the boundaries of the remediation activities conducted for the five areas of contaminated fill soil that had been identified at the Site. Health physicist Glenn Huber (SAHCI) performed the work within the exclusion zones. The excavator, with the exception of the bucket, and the remainder of the support personnel were kept outside of the exclusion zones.

3.5.1 September 2011

The initial excavation of radiologically-contaminated fill soil occurred in the southwest corner of the Site in the vicinity of caisson numbers I-1.9 and I-3.5 (refer to Figure 1). Both areas of elevated readings were discovered during caisson pot-hole construction activities. On Figure 1, the caisson locations are identified alpha numerically by a letter (left side of figure) and numerically (top and bottom of figure). Excavation indicated that the contaminated fill soil was found between about 3-5 feet-bgs (or about 6.75-8.75 ft CCD). Remediation of the two caisson locations (I-1.9 and I-3.5) was initiated on September 12, 2011. Radiologically-contaminated material was excavated and placed directly into 1-cubic yard and 3.5-cubic yard super-sacks that were staged at the site pending arrangements for proper transport and disposal. Approximately 58.5 cubic yards of radiologically contaminated fill soil were containerized during the remediation efforts.

The remediation of radiologically-contaminated fill soil at the I-3.5 exclusion zone was completed. However, a small portion of the exclusion zone at I-9 along the property boundary just north of the sidewalk could not be completely remediated because of concerns with a utility pole and its proximity to the property boundary. The USEPA collected verification samples and released the I-3.5 area and the large remediated portion of the I-1.9 area on September 15, 2011 (refer to Section 3.5.3). Following release of the two locations, potholing to native sand was completed at both without further indication of elevated gamma readings.

The remainder of the on-site remediation of radiologically-contaminated fill soil at the I-9 exclusion zone was completed on December 2, 2011, after the closure of the sidewalk to pedestrian traffic and the removal of the utilities from the pole (refer to Section 3.5.2). The boundaries of the remediated exclusion zones at I-3.5 and I-1.9 are shown on Figure 1.

3.5.2 November - December 2011

The second round of remediation of radiologically-contaminated fill soil occurred at four locations on the western half of the Site. Elevated readings were discovered during the installation of an electrical trench used to deliver power to the crane on October 12, 2011, site grading activities for the installation of the parking garage floor slab on November 17, 2011, and grade beam pot-holing activities on November 21, 2011. The fourth area to be remediated was adjacent to the property boundary at caisson location I-9, which could not be completed during the September 2011 remediation work. Remediation activities were initiated on November 22, 2011.

A small southern portion of the exclusion zone along the property boundary at I-9 (just north of the sidewalk) could not be completely remediated in September 2011 because of concerns with a utility pole and its proximity to the property boundary. Remedial work in this area was initiated on December 2, 2011 to complete the removal of radiologically contaminated soil immediately north of the property boundary. The area was remediated with the excavation of about two 3.5-cubic yard bags of contaminated soil. A soil sample was collected from beneath the edge of the sidewalk (i.e., from the ROW) and analyzed via Nutranl to document the level of contamination at about 7-feet CCD. The results (Appendix C-1, sample ID-3717)

indicated a total radium activity of 36.9 pCi/g. Verification sampling was performed on December 5 and the area released by the USEPA on December 6, 2011.

Remediation of exclusion zone adjacent to the temporary electrical trench for the crane discovered on October 12, 2011 was initiated on December 2 and completed on December 5, 2011. This area was located between the D and E caisson lines and just west of the 1.9 caisson line (refer to Figure 1). A total of three 3.5-cubic yard bags were required to complete the remediation. The excavation necessary to complete the remediation extended to a depth of about 4.75-feet CCD. Verification sampling was performed on December 5 and the area released by the USEPA on December 6, 2011.

Elevated gamma readings were observed at the surface late on the afternoon of November 17, 2011, while excavating fill soil in lifts in the southwest corner of the Site for the parking garage floor slab. This exclusion zone was centered approximately on the caisson 4.4 line halfway between the caisson F and I lines (refer to Figure 1). The elevated readings were discovered at a depth approximately 5-feet below the original parking lot surface (about 6.75-feet CCD). Fill soil was excavated to depth of 4.75-feet CCD to complete the remediation. Fifteen 3.5-cubic yard bags were filled on November 22 and an additional seven were filled on November 29, which completed the remediation. Verification sampling of the area (designated as F4.4-I4.4) was completed on November 29, 2011 and released by the USEPA on November 30, 2011

On November 21, 2011, a 10-foot wide by 2-foot thick area along the lower wall (5-7 ft-bgs) of the grade beam trench between caisson locations A-2 and B-2 (refer to Figure 1) was identified as an exclusion zone. Remediation of this location was initiated on December 6, 2011 and completed later that morning. A total of three 3.5-yard bags were required to complete the remediation. The final depth of the excavation was approximately 4.75-feet CCD. The verification sampling was performed on December 6 and the area released by the USEPA on December 7, 2011.

3.5.3 Verification of Successful Remediation

The radiologically-contaminated fill soil was removed from the exclusion zone area to clean limits by loading the material directly into 1-and 3.5-cubic yard super-sacks. Upon reaching the clean limits, Glenn Huber (SAHCI) conducted a pre-USEPA gamma survey of the areas to determine that the area met the cleanup standard. However, pre-USEPA samples Nutranl analyses were not collected due to the short duration of the remedial efforts and the available scheduling of the verification sampling. The USEPA was notified and mobilized to the Site to conduct a verification survey of the respective exclusion zone(s). The verification survey areas were limited in size to areas no greater than 100 square meters to be consistent with the procedures of SOP-210.

For the USEPA verification survey, each exclusion zone area was divided into four quadrants of approximately equal areas. Five samples were collected for each of the verification survey areas (one sample from each of four quadrants and the fifth sample from the center of the area). These samples were combined to form a single composite sample. In accordance with the Work Plan SOP-210, the composite sample was homogenized by mixing the soil in a clean steel bowl, screened to minus ¼-inch, and five subsamples (sample splits) were generated for radiological analysis. If the average of these five sub-samples was found to be less than the cleanup threshold of 7.1 pCi/g total radium, a notice of successful verification form was prepared for USEPA signature. The supporting analytical data and verification form(s) were faxed to USEPA. After receipt and review, the USEPA signed the form(s) and returned a faxed copy to AECOM, thus releasing the area for unrestricted entry/use and backfilling.

Copies of the signed successful verification forms and Nutranl results for each area are provided in Appendix C. Copies of USEPA NAREL results for these samples are included in Appendix D. Verification sampling of the excavated portion of the I-1.9 exclusion zone was conducted early on September 15, 2011. Results for the five sub-samples ranged from 1.54 to 4.28 pCi/g with an average activity of 2.95 pCi/g total radium. Since the average of the five sub-samples was found to be less than the cleanup threshold of 7.1 pCi/g total radium at the I-1.9 exclusion zone, a successful verification form was prepared for USEPA signature. The supporting data and form were both faxed to USEPA. The area was released by the USEPA later that same day.

At caisson (exclusion zone) location I-1.9 additional remediation of the on-site thorium contamination near the southern property boundary (immediately north of the sidewalk) was not completed until early December 2011. On December 5, 2011, the USEPA conducted verification sampling of the remaining portion between the sheet pile wall and the sidewalk (property line) at the I-1.9 exclusion zone. Results for the five subsamples ranged from 2.38 to 4.37 pCi/g with an average activity of 3.61 pCi/g total radium. Since the average of the five sub-samples was less than the cleanup threshold of 7.1 pCi/g total radium, a successful verification form was prepared for USEPA signature. USEPA released the area on December 6, 2011.

On September 15, 2011, USEPA conducted verification sampling of the I-3.5 exclusion zone. The five samples forming the composite were homogenized and divided into five sub-samples for Nutranl analysis. Results for the five sub-samples ranged from 4.33 to 6.48 pCi/g with an average activity of 5.21 pCi/g total radium. Since the average of the five sub-samples was found to be less than the cleanup threshold of 7.1 pCi/g total radium, a successful verification form was prepared for USEPA signature. The supporting data and form were both faxed to USEPA. USEPA released the area later that same day.

On November 29, 2011, USEPA conducted verification sampling of the F-4.4 to I-4.4 exclusion zone. Results for the five sub-samples from the composite ranged from 3.76 to 5.43 pCi/g with an average activity of 4.29 pCi/g total radium. Since the average of the five sub-samples was less than the cleanup threshold, a successful verification form was prepared for USEPA signature. The supporting data and form were both faxed to USEPA and USEPA released the area on November 30, 2011.

On December 5, 2011, USEPA conducted verification sampling of the D-1/E-1 to D-2/E-2 exclusion zon. The five samples forming the composite were homogenized to create the five sub-samples. Nutranl results for the five sub-samples ranged from 2.39 to 5.12 pCi/g with an average activity of 4.07 pCi/g total radium. Since the average of the five sub-samples was less than the cleanup threshold, a successful verification form was prepared for USEPA signature. USEPA released the area on December 6, 2011.

Finally, on December 6, 2011, USEPA conducted verification sampling of the A-2/A-3 to B-2/B-3 exclusion zone. The five samples forming the composite were homogenized and five sub-samples were prepared. Results for the five sub-samples ranged from 1.62 to 4.41 pCi/g with an average activity of 3.33 pCi/g total radium. Therefore, a successful verification form was prepared for USEPA signature. Subsequently, on December 7, 2011, USEPA released the area.

4.0 Quantity of Radiologically-Contaminated Fill Soil Removed

A total of 66 super-sack type bulk material containers (bags) were filled, which included 27 containing approximately one cubic yard and 39 containing approximately 3.5 cubic yards of radiologically-contaminated fill soil that had been excavated at the Site during the remediation efforts. The total volume of radiologically-contaminated soil remediated was approximately 163.5 cubic yards. The weight of the radiologically-contaminated fill soil is estimated to be about 1.15 tons per cubic yard. Therefore, a total weight of about 188 tons was shipped off-site for disposal.

Nutranl analyses for each super-sack were conducted for manifesting purposes and are provided in Appendix C. The Nutranl results for the individual super-sacks averaged 28.6 pCi/g total radium with a maximum activity of 175.9 pCi/g total radium. Soils removed consisted of brown-black fill soils with small amounts of brick/concrete debris.

The material was transported for disposal to the U.S. Ecology RCRA Facility in Grand View, Idaho. On October 20-21, 2011, four flatbed trucks were loaded with the radiologically-contaminated soil from the remediation activities conducted in September 2011 and used to transport the material for disposal at the U.S. Ecology RCRA Facility. Shipment for disposal of the radiologically-contaminated soil remediated in November and December 2011 was initiated on December 29, 2011 and completed on January 6, 2012. A total of six flatbed trucks were used to transport the material for disposal at the U.S. Ecology RCRA Facility. The six flatbed trucks were each loaded with five 3.5-cubic yard super-sacks per truck. Copies of the manifest for the shipments to the U.S. Ecology RCRA Facility, Idaho are included in Appendix F.

The total cost to conduct the required activities was approximately \$365,600 of which \$210,300 was spent for screening/remediation labor, documentation and reporting, supplies and equipment, while \$155,300 on waste transportation, manifesting and disposal.

5.0 Radiologically-contaminated Fill Remaining On-Site

No known radiologically-contaminated fill soil remains on the Site. Additional on-site excavation or excavation in the ROW is not anticipated since construction activities have been completed.

6.0 Difficulties Encountered

Only minor difficulties were encountered during the surveying or remediation of radiologically-contaminated fills. The difficulties primarily included encounters with underground obstructions (i.e., concrete slabs, footings, etc.). Ultimately, none of these difficulties impacted screening or remediation.

7.0 Analytical Results

7.1 Soil Sample Radiological Analytical Results

Glenn Huber (SAHCI) analyzed the soil samples collected during the remediation process by the Nutranl analysis methodology to document the concentrations of the target cleanup radionuclides for general soil activity, waste disposal as well as verification sampling. The Nutranl analyses for the samples are presented in Appendix C by laboratory number, which is also chronological. Samples collected for verification purposes (five sub-samples per verification area) by the USEPA were analyzed by SAHCI. The November and December 2011 samples also were transferred to the USEPA under chain-of-custody. The USEPA NAREL lab results for the November and December 2011 samples are included in Appendix E.

7.2 Equipment Release Surveys

Excavating equipment used in the excavation of radiologically-contaminated fill was required to be surveyed to confirm the equipment was free of radiological contaminants prior to being released from the Site. This equipment was limited to the excavator bucket used to excavate and load the contaminated fill. The remainder of the excavator was not allowed within the exclusion zones. To confirm the absence of contaminants, the treads and other portions of the equipment, where soil could potentially accumulate, were surveyed for contamination with a Ludlum Model 3 survey meter with a pancake G-M probe.

For the excavator buckets, wipes were also taken in accordance with Work Plan SOP-45, and alpha counts were made to confirm the absence of contamination. The limits listed in SOP 345 were those of 32 III. Admin. Code Part 340 Appendix A (33 dpm/100 cm²). However, in practice with "as low as reasonably achievable" (ALARA), the most restrictive federal level of 20 dpm/100 cm² for removable contamination from Table 1 of the Nuclear Regulatory Commission's Regulatory Guide 1.86 was used for equipment release. A copy of the alpha count survey results were well below this most restrictive level and are included in Appendix G.

7.3 Perimeter Air Monitoring

Glenn Huber (SAHCI) conducted excavation area high volume air monitoring for airborne radioactivity whenever excavation of radiologically-contaminated fill was being conducted. The Site is sufficiently large so that the monitoring at the perimeter would not necessarily characterize the potential airborne contaminants from work at discrete locations within the Site. Therefore, air monitoring locations were established at two locations on the down-wind perimeter of the excavation (exclusion zone) areas. Thus, the widespread distribution of the exclusion zone activities necessitated that area air monitoring equipment be repositioned for each excavation to comply with the air monitoring plan.

Air samples are typically analyzed the day after the collection and again after four days to allow for the short-lived progeny to decay. The daily and weekly air concentrations were compared to the most limiting effluent concentration limit for thorium-232, which is 4E-15 μ Ci/ml based on 10 CFR Part 20 Appendix B Table 2 (Effluent Concentration Limits). No exceedances of the exposure limit for the Site perimeter were documented for the perimeter air monitoring. The high volume air monitoring results are provided in Appendix H-1.

7.4 Personal Air Monitoring

Personal air monitoring (PAM) was conducted for persons working in exclusion zones. As stated previously, because of the limited size and short duration of the remediation efforts the only individual to work in the exclusion zone was the health physicist Glenn Huber (SAHCI). However, as an extra source of information, a PAM was also worn by the laborer who was assisting with the opening and closing of the super-sacks just outside of the exclusion zone. PAM data for radioactivity for both one-day and four-day analyses are

typically performed, but do to work schedules only the four-day analyses were performed. These data (refer to Appendix H) show no exceedances of the allowable exposure limits for this project.

8.0 Summary and Conclusions

The work documented at the 515 N. Peshtigo Court Site was conducted in accordance with the Administrative Settlement Agreement and Order on Consent for Removal Action Settlement Agreement dated September 2, 2011 (Docket No. V-W-11-C-976). The work described in this Completion Report was also conducted in accordance with the procedures contained in the Work Plan for Remediation of Radiologically-Contaminated Soil at 515 N. Peshtigo Court (Work Plan) prepared by AECOM (revised February 2012) and approved by the USEPA. The Completion Report provides a summary of the surveys conducted and the remediation of radiologically-contaminated fill soil subsequently identified as the result of radiological monitoring performed during the implementation of the Work Plan activities. As a result, the known radiologically-contaminated fill soil on the Site has been remediated. This process included obtaining the verification sign-off from USEPA for the areas at the Site where radiologically-contaminated fill was remediated.

As a result, AECOM, on behalf of Related BIT 500 Lake Shore Owner LLC, requests written approval by the USEPA of the Completion Report for the 515 N. Peshtigo Court Site. On the basis of the removal action having been completed in accordance with the USEPA approved Work Plan, and the verification by USEPA that all identified radiologically-contaminated material in excess of the cleanup criteria has been removed, AECOM also requests that USEPA issue a Notice of Completion for the 515 N. Peshtigo Court Site, confirming that (a) all identified radiologically-contaminated materials with levels of radioactivity in excess of the cleanup threshold standards set forth in the Work Plan have been removed from the Site as required by the Work Plan, (b) no further removal or cleanup action is required at this time with respect to the radiologically-contaminated materials on the 515 N. Peshtigo Court Site, and (c) all Work, as that term is defined in the Consent Order, has been fully performed in accordance with the terms of the Consent Order, with the exception of any continuing obligations required by the Consent Order. Related BIT 500 Lake Shore Owner LLC will record an Environmental Covenant that complies with the Illinois Uniform Environmental Covenant Act to ensure that any and all future intrusion into the unscreened fill material will be radiologically surveyed and managed in accordance with the Work Plan to ensure protection of workers and the public.

In conclusion, this 515 North Peshtigo Court Completion Report and the work described herein meet the requirements of the September 2, 2011, Administrative Settlement Agreement and Order on Consent for Removal Action. The radiologically-contaminated fill soil identified on the Site has been remediated in accordance with the Work Plan. As a result, AECOM, on behalf of the Related BIT 500 Lake Shore Owner LLC, requests written approval by the USEPA of the Completion Report and acknowledgement that the obligations outlined in the Work Plan are complete for the 515 N. Peshtigo Court Site (AKA 500 North Lake Shore Drive).

9.0 References

AECOM (July 28, 2011) Radiation Survey of Subsurface Investigation, 515 N. Peshtigo Ct., Chicago, Illinois, AECOM Project No. 60219374

AECOM (revised February 2012) Work Plan for Remediation of Radiologically-Impacted Soil at 515 N. Peshtigo Court, Chicago, Illinois, AECOM Project No, 60219374.

RSSI For Pioneer Environmental Services (December 23, 2008) Down-hole Gamma and Soil Spectroscopy Results Report, Chicago Illinois

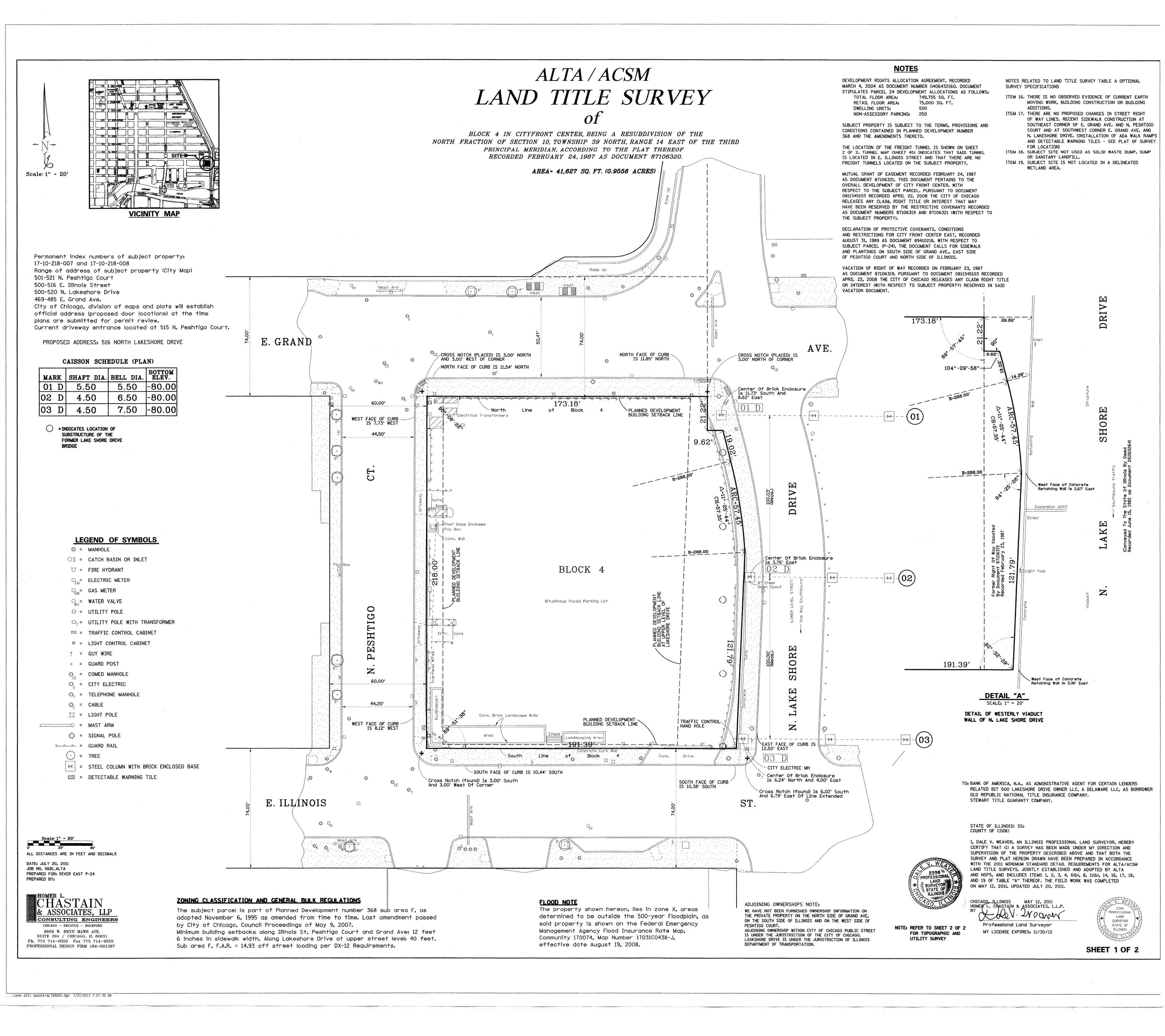
Pioneer Environmental Services (October 29, 2010) Phase I Environmental Site Assessment at 515 North Peshtigo Court, Chicago, Illinois, Pioneer Environmental Services Project No, 10-0607-101.

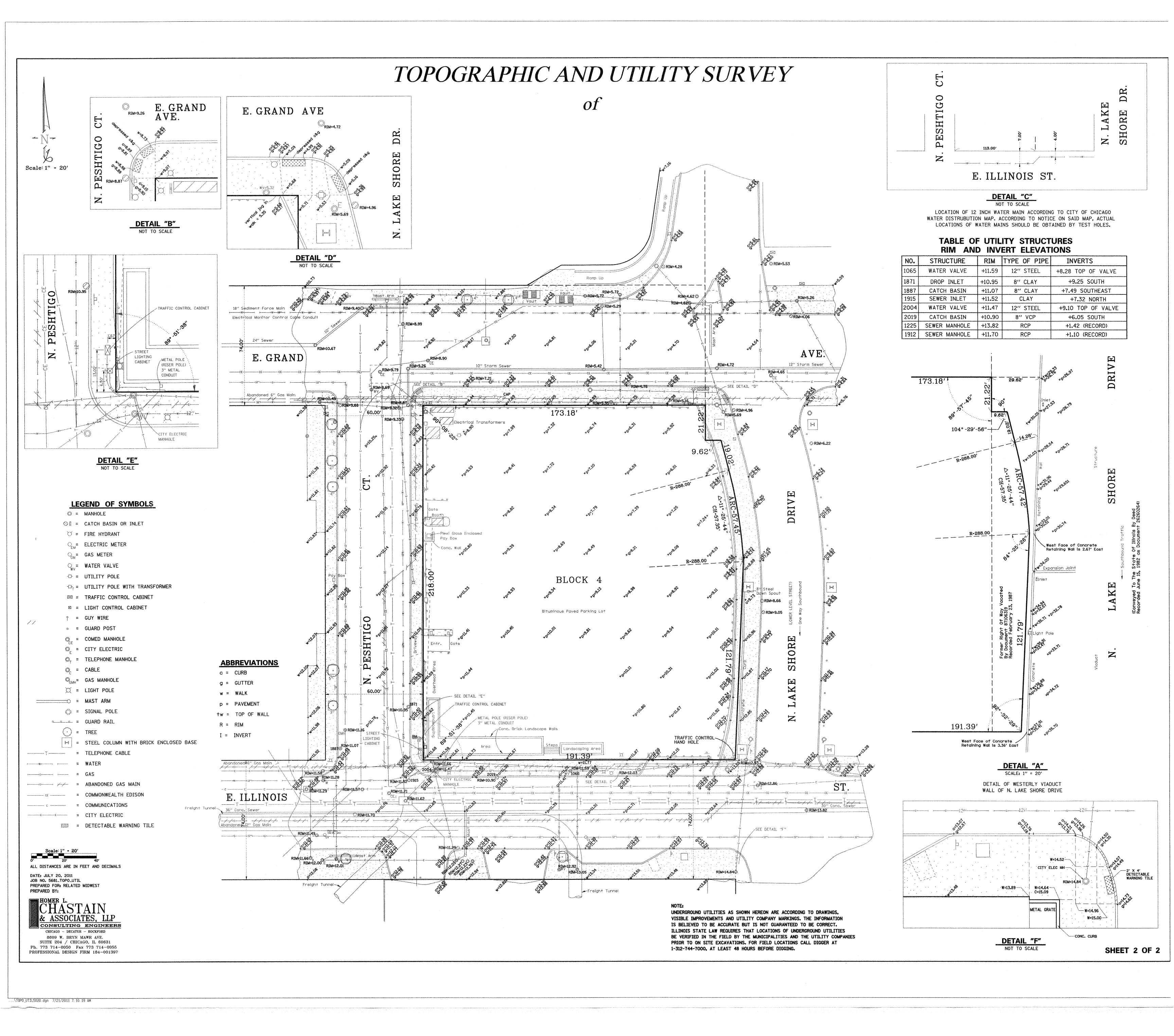
STS (aka AECOM) (November 20, 2000) Radiation Survey of Three Parking Lots in the Vicinity of the Former Kraft Building, Chicago, Illinois – STS Project No. 1-24418-XO

USEPA (September 2, 2011) Administrative Settlement Agreement on Consent for Removal Action (Docket No. V-W-11-C-976)

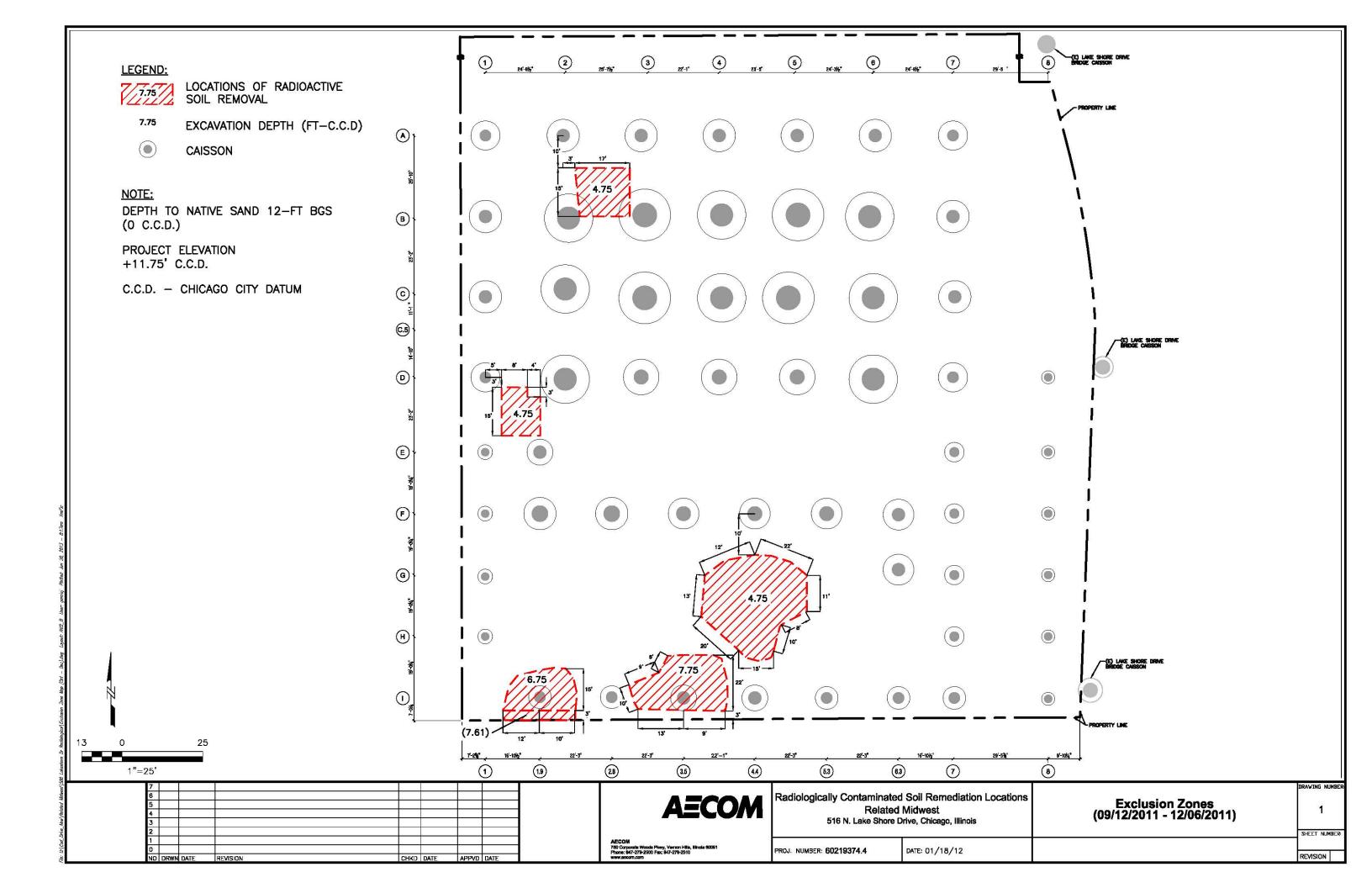
Drawings 1 & 2

Land Title Surveys

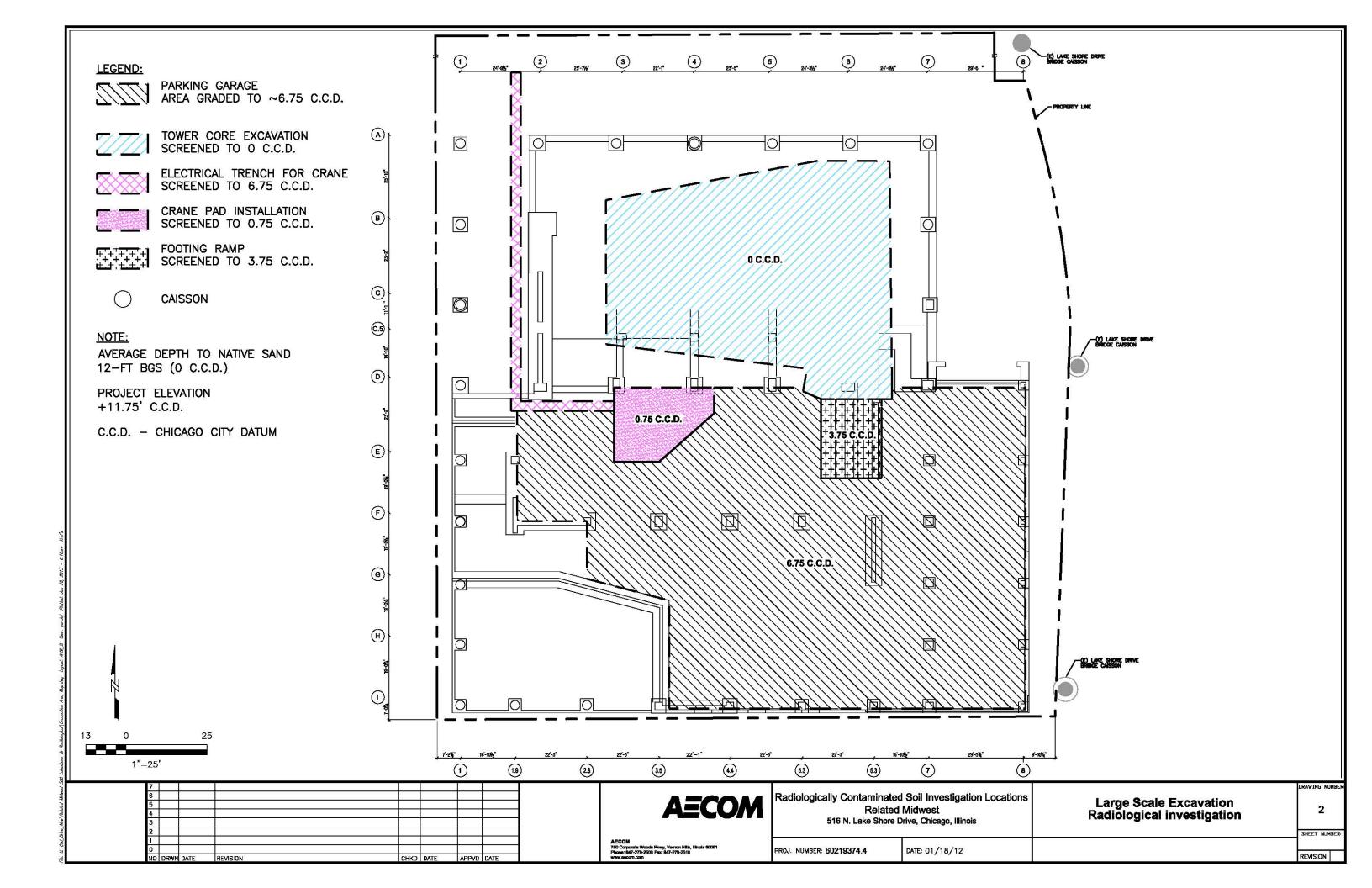




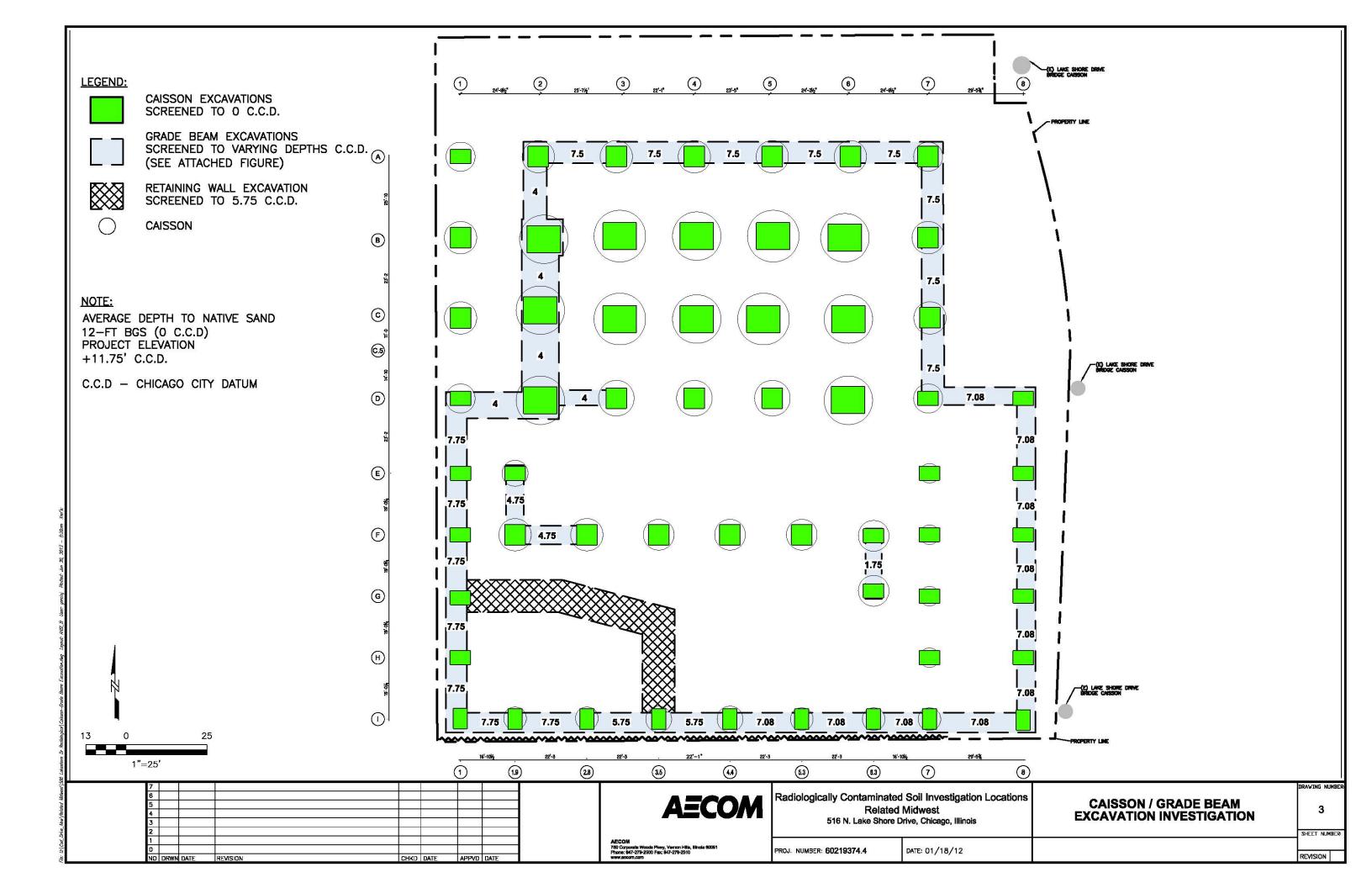
Exclusion Zone Locations



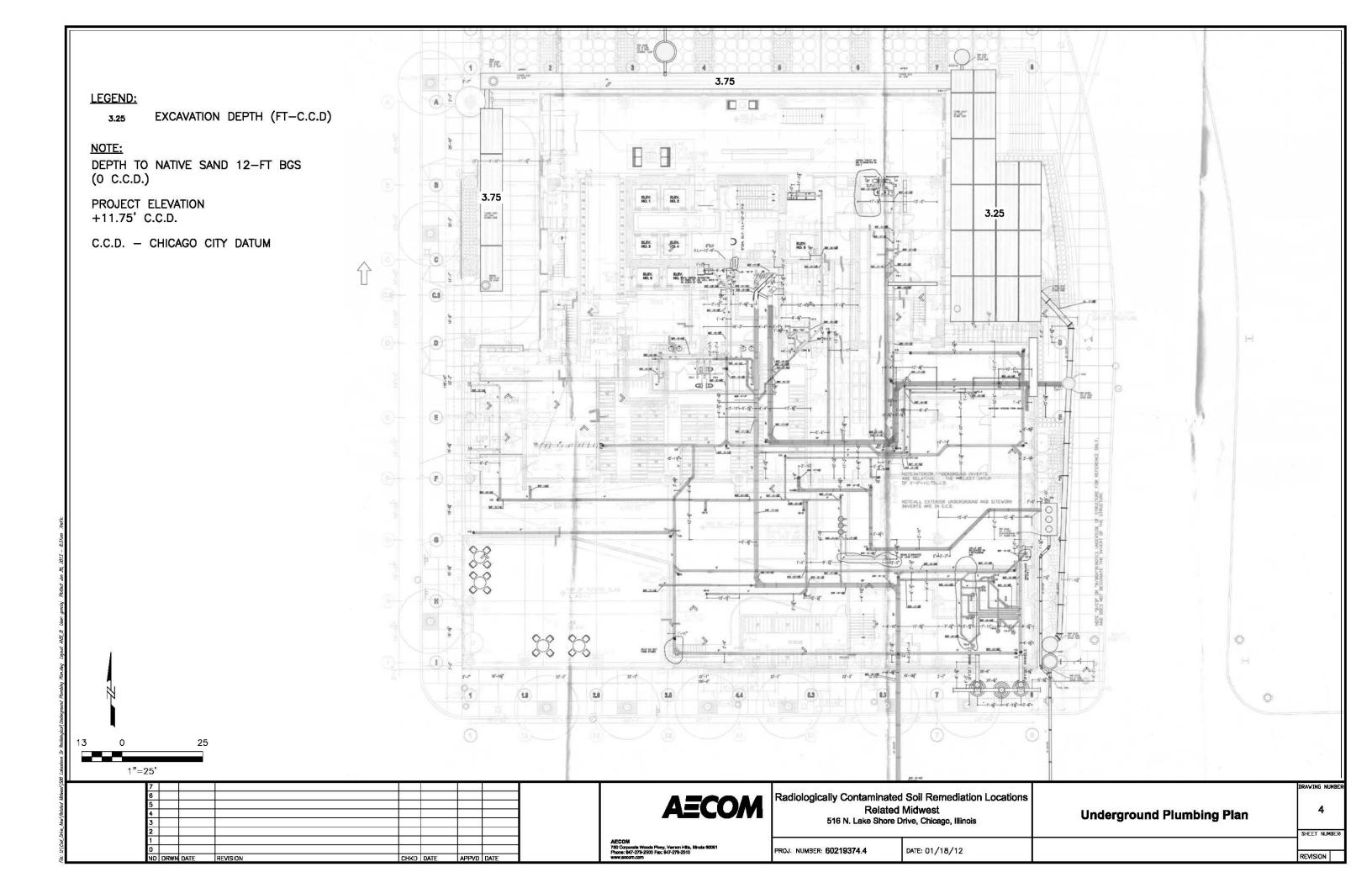
Large-Scale Excavation Radiological Investigation



Caisson/Grade Beam Excavation Investigation



Utility Installation Radiological Excavation Investigation



Appendix A

USEPA Order



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

SEP 0 2 2011

REPLY TO THE ATTENTION OF:

S-6J

VIA ELECTRONIC MAIL AND OVERNIGHT MAIL

Related BIT 500, LLC c/o Mr. Leo Dombrowski Attorney at Law Wildman, Harrold, Allen & Dixon LLP 225 West Wacker Drive, Suite 3000 Chicago, Illinois 60606

Re: Lindsay Light II Site, Operable Unit 18 (05YT) 515 North Peshtigo Court, Chicago, Illinois

Dear Mr. Dombrowski:

Enclosed is the fully executed Lindsay Light II Operable Unit 18 Administrative Settlement and Order on Consent for Removal Action (Settlement Agreement) for the property located at 515 North Peshtigo Court, Chicago, Illinois. This Settlement Agreement is issued pursuant to Sections 106 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended.

Thank you and your client for your cooperation in reaching this Settlement Agreement. We look forward to the cleanup as it will help ensure the protection of construction workers, utility workers and the public in Streeterville. If you have any questions, please call Mary Fulghum at (312) 886-4683 or Cathleen Martwick at (312) 886-7166.

Richard C. Karl

² Director, Superfund Division

cc: Mr. Gary King, Illinois Environmental Protection Agency Superfund Program Manager

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5

IN THE MATTER OF:

Lindsay Light II Operable Unit 515 North Peshtigo Court Chicago, Illinois

Respondent:

Related BIT 500 Lakeshore Owner, LLC

ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMOVAL ACTION

Docket No. V - W - 11 · C - 976

Proceeding Under Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622

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I. JURISDICTION AND GENERAL PROVISIONS

- 1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("U.S. EPA") and Respondent. This Settlement Agreement provides for the performance of removal actions by Respondent including recording any Environmental Covenant on portions of the Site where radioactive contamination may be present and also the reimbursement of certain response costs incurred by the United States at or in connection with the property designated Lindsay Light Operable Unit ("OU") 18, located at 515 North Peshtigo Court, Chicago, Illinois and that was formerly a parking lot and known as the "Site."
- 2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended ("CERCLA"). This authority has been delegated to the Administrator of the U.S. EPA by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2923, and further delegated to the Regional Administrators by U.S. EPA Delegation Nos. 14-14-A, 14-14-C and 14-14-D, and to the Director, Superfund Division, Region 5, by Regional Delegation Nos. 14-14-A, 14-14-C and 14-14-D.
- 3. U.S. EPA has notified the State of Illinois (the "State") of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).
- 4. U.S. EPA and Respondent recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondent agrees to comply with and be bound by the terms of this Settlement Agreement and further agrees that it will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon U.S. EPA and upon Respondent and its successors and assigns. Any change in ownership or corporate status of the Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter the Respondent's responsibilities under this Settlement Agreement.

- 6. Respondent is jointly and severally liable for carrying out all activities required by this Settlement Agreement.
- 7. Respondent shall ensure that its contractors, subcontractors, and representatives receive a copy of and comply with this Settlement Agreement. Respondent shall be responsible for any noncompliance with this Settlement Agreement.

III. <u>DEFINITIONS</u>

- 8. Unless otherwise expressly provided herein, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the Exhibits attached hereto and incorporated hereunder, the following definitions shall apply:
- a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, et seq.
- b. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.
- c. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXXI.
- d. "U.S. EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.
- e. "Response Costs" shall mean all costs, including direct and indirect costs, that the United States incurred or incurs reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement on or after April 6, 2011.
- f. "Interest" shall mean interest at the rate specified for interest on investments of the U.S. EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

- g. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.
- h. "Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent and all Exhibits attached hereto (listed in Section XXX). In the event of conflict between this Settlement Agreement and any Exhibit, this Settlement Agreement shall control.
 - i. "Parties" shall mean U.S. EPA and Respondent.
- j. "RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, et seq. (also known as the Resource Conservation and Recovery Act).
 - k. "Respondent" shall mean Related BIT 500 Lakeshore Owner, LLC, a limited liability company, organized and existing under the laws of the State of Illinois].
- I. "Site" shall mean the Lindsay Light II, Operable Unit 18, 515 North Peshtigo Court that was a parking lot in Chicago, Cook County, Illinois and depicted generally on the map attached as Exhibit A.
 - m. "State" shall mean the State of Illinois.
- n. "Uninvestigated Site Area" shall mean any portion of the Site which is not radiologically surveyed in 18-inch lifts to native sand in accordance with the Work Plan or any portion of the site where any known contamination will remain after completion of the Work.
- o. "U.S. EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.
- p. "Waste Material" shall mean 1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); 3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and 4) any "hazardous material" under Section 3.125 of the Illinois Environmental Protection Act, 415 ILCS 5/3.125 (2002).
- q. "Work" shall mean all activities the Respondent is required to perform under this Settlement Agreement.

r. "Work Plan" shall mean the U.S. EPA-approved work plan including schedule described in Section VIII Work to be Performed.

IV. FINDINGS OF FACT

- 9. Based on available information, including the Administrative Record in this matter, U.S. EPA hereby finds that:
 - a. The Site is located at 515 North Peshtigo Court in Chicago, Illinois.
- b. The Site is located one city block East of Lindsay Light II, 316 E. Illinois Street where the Lindsay Light Company ("Lindsay Light") refined monazite ore to produce thorium nitrate and manufacture thorium-impregnated gas mantles.
- c. Beginning in 1904, Lindsay Light refined thorium and manufactured gas lights and gas mantles for residential and commercial use at several locations in the Streeterville area of Chicago. Lindsay's thorium refining process resulted in a waste known as mill tailings that was apparently used as fill material or otherwise came to be located in the Streeterville area.
- d. The Lindsay Light mill tailings contain thorium-232 which is a radionuclide that is a hazardous substance under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).
- e. Thorium-232 has a half-life of 14 billion years, and decays by alpha emission, with accompanying gamma radiation. Thorium-232 is the top of a long decay series that contains key radionuclides such as radium-228, its direct decay product, and radon-220.
- f. U.S. EPA designated the initial thorium removal action at the 316 East Illinois Street that was the former location of Lindsay Light's ore processing plant as the Lindsay Light II Removal Site. Following that initial removal action, during which approximately 24,000 cubic yards of thorium contaminated soils were removed, U.S. EPA has identified 17 other removal action operable units associated with the Lindsay Light II facility in addition to 630 North McClurg Site and, to date, approximately 50,000 cubic yards of thorium contaminated material associated with the Lindsay Light II facility have been removed from the Streeterville area.
- g. In addition to the thorium contamination discovered at 316 East Illinois Street, which is one city block South of the Site, U.S. EPA also has identified subsurface thorium contamination at the adjacent city block immediately south of the Site (Lindsay Light II, OU 10, Kraft Building) and in the city rights-of-way near the intersection of Illinois and Peshtigo.

- h. On April 6, 2011, Respondent notified U.S. EPA that Respondent expects to begin to excavate the Site by July 2011 and a planning period of at least 6 months does not exist.
- i. On August 29, 2011, Respondent notified U.S. EPA that while excavating an exploratory pothole at the Site, Respondent encountered elevated gamma readings indicative of thorium contamination.
- j. Construction laborers, utility workers and the public may be exposed to elevated levels of thorium if the Site is excavated without proper radiation monitoring and management and disposal of radioactively contaminated materials.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

- 10. Based on the Findings of Fact set forth above, and the Administrative Record supporting this removal action, U.S. EPA has determined that:
- a. The Site is a part of a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).
- b. The contamination found at the Lindsay Light II facility, as identified in the Findings of Fact above, includes a "hazardous substance" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).
- c. The Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).
- d. The Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is jointly and severally liable for performance of response action and for response costs incurred and to be incurred at the Site.
 - i. Respondent is the "owner" and/or "operator" of the Site, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).
- e. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility into the "environment" as defined by Sections 101(22) and 101(8) of CERCLA, 42 U.S.C.§§ 9601(22) and 9601(8).

- f. The conditions present at the facility constitute a threat to public health, welfare, or the environment based upon the factors set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, as amended ("NCP"), 40 C.F.R. §300.415(b)(2). These factors include, but are not limited to, the following:
 - i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants; this factor is present at the Site due to the existence of elevated levels of thorium found in subsurface soils that will be exposed by the removal of overburden and excavation.
 - ii. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate; this factor is present at the facility due to the existence of elevated levels of thorium in subsurface soils that will be exposed by the removal of overburden and excavation.
 - iii. Other situations or factors that may pose threats to public health or welfare or the environment; this factor is present at the facility due to the existence of elevated levels of thorium in subsurface soils that may be unearthed during construction activities that may expose construction laborers, utility workers and the public to excessive levels of thorium.
- g. The removal action, including Environmental Covenants, required by this Settlement Agreement is necessary to protect the public health, welfare, or the environment, and, if carried out in compliance with the terms of this Settlement Agreement, will be consistent with the NCP, 42 U.S.C. §§ 9604(a)(1) and 9622(a).

VI. <u>SETTLEMENT AGREEMENT AND ORDER</u>

Based upon the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for this Site, it is hereby Ordered and Agreed that Respondent shall comply with all provisions of this Settlement Agreement, including, but not limited to, all Exhibits to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. <u>DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR,</u> <u>AND ON-SCENE COORDINATOR</u>

- 11. Respondent has selected a supervising contractor known as AECOM to perform the Work at the Site. Respondent has provided U.S. EPA with the qualifications of AECOM. If Respondent contracts with any other contractor(s) or subcontractor(s) to perform Work, Respondent must provide notice of the name(s) and qualification(s) of such person(s) at least 5 business days prior to commencement of such Work. U.S. EPA retains the right to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If U.S. EPA disapproves of a selected contractor, Respondent shall retain a different contractor and shall notify U.S. EPA of that contractor's name and qualifications within 3 business days of U.S. EPA's disapproval. The supervising contractor must demonstrate compliance with ANSI/ASQC E-4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the contractor's Quality Management Plan ("QMP"). The QMP should be prepared consistent with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B0-1/002), or equivalent documentation as required by U.S. EPA.
- 12. Respondent has designated Steve Kornder of AECOM as the Project Coordinator who shall be responsible for administration of all actions by Respondent required by this Settlement Agreement. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site work. U.S. EPA retains the right to disapprove of any subsequent designated Project Coordinator. If U.S. EPA disapproves of a designated Project Coordinator, Respondent shall retain a different Project Coordinator and shall notify U.S. EPA of that person's name, address, telephone number, and qualifications within 4 business days following U.S. EPA's disapproval. Receipt by Respondent's Project Coordinator of any notice or communication from U.S. EPA relating to this Settlement Agreement shall constitute receipt by Respondent.

- 13. U.S. EPA has designated Verneta Simon of the Emergency Response Branch, Region 5, as its On-Scene Coordinator ("OSC") and Gene Jablonowski, Remedial Project Manager, of the Remedial Response Branch, Region 5 as its alternate OSC. Except as otherwise provided in this Settlement Agreement, Respondent shall direct all submissions required by this Settlement Agreement to the OSCs in accordance with Section XXIX Notices and Submissions. Respondent is encouraged to make its submissions to U.S. EPA on recycled paper (which includes significant post consumer waste paper content where possible) and using two-sided copies.
- 14. U.S. EPA and Respondent shall have the right, subject to Paragraph 11, to change their respective designated OSCs or Project Coordinator. U.S. EPA shall notify the Respondent, and Respondent shall notify U.S. EPA, as early as possible before such a change is made, but in no case less than 24 hours before such a change. The initial notification may be made orally but it shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

- 15. Respondent shall perform, at a minimum, the following removal activities:
 - a) Develop a Work Plan for the radiological assessment of the site.
 - b) Develop and implement a site health and safety plan.
 - c) Develop and implement an air monitoring plan.
 - d) Develop and implement site security measures.
 - e) Conduct land surveying to the extent necessary locate all property boundaries, special features (pipes, storage tanks, etc.), and any sample locations.
 - f) Conduct radiation surveillance and sampling in compliance with the U.S. EPA approved work plan.
 - g) Collect soil samples and analyze for radionuclide content and RCRA characteristics. These results will then be used by the Respondent to correlate subsurface radiation levels and radionuclide content, and to determine the disposal facility.
 - h) Conduct off-site radiological surveying and sampling as necessary should contamination be discovered within the sidewalk rights-of-ways surrounding the Site and, at a minimum implement 40 C.F.R. § 192 if deemed necessary.

- i) Based upon soil results, remove, transport and dispose of all characterized or identified hazardous substances, pollutants, wastes or contaminants at a RCRA/CERCLA approved disposal facility in accordance with the U.S. EPA offsite rule.
- j) The soil clean-up criterion is 7.1 picoCuries per gram (pCi/g) total radium (Ra-226 + Ra-228) including background, unless analyses indicate the existence of additional contaminants, hazardous substances, pollutants or waste.
- k) If any portion of the Site is not radiologically surveyed in 18-inch lifts or if any known contamination will remain after completion of the Work then, using elevation and Global Positioning System (GPS) coordinates, Respondent shall identify and depict all locations that were not radiologically surveyed in 18-inch lifts or where any known contamination will remain after completion of the Work and shall implement U.S. EPA-approved Environmental Covenants or other U.S. EPA-approved institutional controls pertaining to the Site.

16. Work Plan and Implementation.

- a. On July 19, 2011, Respondent submitted to U.S. EPA for approval a draft Work Plan, including a schedule, for performing the removal action generally described in Paragraph 15 above.
- b. U.S. EPA may approve, disapprove, require revisions to, or modify the draft Work Plan in whole or in part. If U.S. EPA requires revisions, Respondent shall submit a revised draft Work Plan within 7 business days of receipt of U.S. EPA's notification of the required revisions. Respondent shall implement the Work Plan as approved in writing by U.S. EPA in accordance with the schedule approved by U.S. EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be incorporated into and become fully enforceable under this Settlement Agreement.
- c. Respondent shall not commence any Work except in conformance with the terms of this Settlement Agreement. Respondent shall not commence implementation of the Work Plan developed hereunder until receiving written U.S. EPA approval pursuant to Paragraph 16(b).
- 17. <u>Health and Safety Plan</u>. Respondent has submitted for U.S. EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Settlement Agreement. This plan must be prepared consistent with U.S.

EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. If U.S. EPA determines that it is appropriate, the plan shall also include contingency planning. Respondent shall incorporate all changes to the plan recommended by U.S. EPA and shall implement the plan during the pendency of the removal action.

18. Quality Assurance and Sampling.

- a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a OA/OC program that complies with the appropriate U.S. EPA guidance. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by U.S. EPA. U.S. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements. Respondent shall prepare a Quality Assurance Project Plan ("QAPP") as part of the Work Plan except in circumstances involving emergency or noncomplex removal work. The QAPP should be prepared in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001), and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998).
- b. Upon request by U.S. EPA, Respondent shall have such a laboratory analyze samples submitted by U.S. EPA for QA monitoring. Respondent shall provide to U.S. EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.
- c. Upon request by U.S. EPA, Respondent shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples. Respondent shall notify U.S. EPA not less than 3 business days in advance of any sample collection activity, unless shorter notice is agreed to by U.S. EPA. U.S. EPA shall have the right to take any additional samples that U.S. EPA deems necessary. Upon request, U.S. EPA shall allow Respondent to take split or duplicate

samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

19. Reporting.

- a. Respondent shall submit a written progress report to U.S. EPA concerning actions undertaken pursuant to this Settlement Agreement every 30th day after the date of receipt of U.S. EPA's approval of the Work Plan until termination of this Settlement Agreement, unless otherwise directed in writing by the OSC. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.
- b. Respondent shall submit 3 copies of all plans, reports or other submissions required by this Settlement Agreement, or any approved work plan. Upon request by U.S. EPA, Respondent shall submit such documents in electronic form.
- c. Respondent shall prior to the transfer or conveyance of any interest in real property at the Site (excluding condominium units or parking spaces), give written notice to the transferee that the property is subject to this Settlement Agreement and written notice to U.S. EPA of the transfer or conveyance, including the name and address of the transferee. Respondent also agrees to require that its successors comply with the immediately preceding sentence and Sections IX (Site Access), X (Environmental Covenant/Institutional Control Document) and XI (Access to Information).
- 20. <u>Final Report</u>. Within 60 calendar days after completion of all Work required by Section VIII of this Settlement Agreement, Respondent shall submit for U.S. EPA review a final report summarizing the actions taken to comply with this Settlement Agreement. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports" and with the guidance set forth in "Superfund Removal Procedures: Removal Response Reporting POLREPS and OSC Reports" (OSWER Directive No. 9360.3-03, June 1, 1994). The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (e.g., manifests, invoices, bills, contracts, and permits). The final report shall also

include the following certification signed by a person who supervised or directed the preparation of that report:

"Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

21. Off-Site Shipments.

- a. Radioactive Waste Material. Respondent will transport radioactive waste material to a disposal facility licensed to accept radioactive Waste Material from the Site. Prior to the initial shipment of radioactive Waste Material originating from the Site, Respondent shall provide written notification of such shipment to the appropriate state environmental official and to the On-Scene Coordinators.
 - i. Respondent shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.
- b. Other Waste Material. If Respondent encounters any hazardous substances that are not radioactively contaminated in the course of conducting the Work, then before shipping any such non-radioactively contaminated hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondent shall obtain U.S. EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.
 - i. Prior to the initial shipment of non-radioactively contaminated Waste Material originating from the Site, Respondent shall provide written notification of such shipment to the appropriate state environmental official and to the On-Scene Coordinators. Settling Defendant shall

comply with the terms and conditions of the notification requirements of Paragraph 21.a. i. for each such shipment of non-radioactive hazardous substances, pollutants, and contaminants.

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ii. The identity of any facility and state receiving the non-radioactively contaminated Waste Material will be determined by Respondent following the award of the contract for the removal action. Respondent shall provide the information required by Paragraph 21(a) and 21(b) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

IX. SITE ACCESS

- 22. If the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by the Respondent, Respondent shall, commencing on the Effective Date, provide U.S. EPA, the State, and their representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement.
- 23. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use its best efforts to obtain all necessary access agreements within 10 business days after the Effective Date, or as otherwise specified in writing by the OSC. Respondent shall immediately notify U.S. EPA if after using its best efforts it is unable to obtain such agreements. For purposes of this Paragraph, "best efforts" include the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing its efforts to obtain access. U.S. EPA may then assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as U.S. EPA deems appropriate. Respondent shall reimburse U.S. EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XVI (Payment of Response Costs).
- 24. Notwithstanding any provision of this Settlement Agreement, U.S. EPA and the State retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. ENVIRONMENTAL COVENANT/INSTITUTIONAL CONTROL DOCUMENT

- 25. <u>Post-Removal Site Control</u>. Consistent with Section 300.415(*l*) of the NCP and OSWER Directive No. 9360.2-02, upon completion of all Work required by Section VIII of this Settlement Agreement, if any portion of the Site is not radiologically surveyed in 18-inch lifts to native sand in accordance with the approved Work Plan or if any known contamination will remain after completion of the Work then:
- a. In accordance with the Work Plan, Respondent shall submit to U.S. EPA a map of the Uninvestigated Site Area showing elevations and GPS coordinates of actual or potential thorium-contaminated Waste Material; and
- b. If Respondent, its contractors, representatives or agents disturb, expose or intrude upon the soils in the Uninvestigated Site Area, Respondent, its contractors, representatives and agents shall notify U.S. EPA, both by telephone and in writing, of plans to work in the Uninvestigated Site Area. Respondent shall notify U.S. EPA at least 72 hours prior to (but no more than 21 calendar days in advance of) commencing such activities. If material containing exceeding 7.1 pCi/g (total radium (Ra-226 +Ra-228) is identified, the Respondent shall provide a letter report to U.S. EPA explaining how the work was conducted in accordance with the Work Plan within 60 days of completion of the work.
- 26. Within thirty (30) days of the completion of all Work required by Section VIII of the Settlement Agreement, if any portion of the Site is not radiologically surveyed in 18-inch lifts to native sand in accordance with the Work Plan or if any known contamination will remain after completion of the Work, Respondent shall record, with the Recorder of Deeds, Cook County, Illinois, an Environmental Covenant, pursuant to the Uniform Environmental Covenants Act, 765 ILCS Ch. 22 (UECA) or other institutional control document ("Environmental Covenant"), that U.S. EPA has approved in writing for this Site, and Respondent agrees that every subsequent deed or conveyance or transfer of any property interest instrument will be subject to the Environmental Covenant. The Respondent further agrees, as described in Paragraph 27, that U.S. EPA must pre-approve any modification (including any deletion) of that language in the Environmental Covenant.
- a. In the event of a conveyance or transfer of property interest, Respondent's obligations under this Settlement Agreement, including, but not limited to, its obligation to provide or secure access and institutional controls, as well as to abide by such institutional controls pursuant to this Section (Environmental Covenants/Institutional Control Document), shall continue to be met by Respondent unless otherwise agreed to by the U.S. EPA in writing. In no event shall the conveyance or transfer of property interest release or otherwise affect the

liability of Respondent to comply with all provisions of this Settlement Agreement unless otherwise agreed to among the Parties hereto in writing.

- c. The intent of Respondent is to record an Environmental Covenant that is applicable to all subsequent owners of the Site. The Environmental Covenant will apply to any portion of the Site that is not radiologically surveyed in 18-inch lifts or where any known contamination will remain after completion of the Work. The Environmental Covenant shall provide the following:
 - 1) subject to Paragraph 27, a restriction that "runs with the land" regulating the disturbance of, exposure of or intrusion upon any portion of the Uninvestigated Site Area;
 - 2) the right to enforce said restrictions;
 - 3) a right of access to the Site;
 - 4) prior notice of disturbance, exposure, intrusion, or excavation of the soils in any portion of the Site that is not radiologically surveyed in 18-inch lifts or where any known contamination will remain; and
 - 5) an agreement that when soils are disturbed, exposed, intruded or excavated in those areas, those activities are conducted in accordance with the Work Plan.
- d. The Respondent agrees that every subsequent deed or other instrument conveying or transferring a property interest in the real estate underlying the Site or any portion thereof shall be subject to the Environmental Covenant.
- 27. U.S. EPA may terminate the restrictions in Paragraphs 25 and 26, in whole or in part, in writing, as authorized by law. If requested by the U.S. EPA, such writing will be executed by the Respondent in recordable form and recorded with the Recorder of Deeds, Cook County, Illinois. Respondent may modify or terminate the above restrictions in whole or in part, in writing, with the prior written approval of U.S. EPA. Respondent may seek to modify or terminate, in whole or in part, the restrictions by submitting to U.S. EPA, for approval, a written application that identifies each such restriction to be terminated or modified, describes the terms of each proposed modification and includes proposed revision(s) to the Environmental Covenant and institutional control document described in this Section X (Environmental Covenants/Institutional Control Document). Each application for termination or modification of any restriction shall include a demonstration that the requested termination or modification will not interfere with, impair or reduce protection of human health and the environment. If U.S.

EPA makes a determination that an application satisfies the requirements of this Paragraph, including the criteria specified above, U.S. EPA will notify Respondent in writing. If U.S. EPA does not respond in writing to a request to change land use within 90 days of its receipt of that request, unless Respondent agrees to extend this period beyond 90 days, U.S. EPA may be deemed to have denied the request. If a modification to or termination of restriction is approved, Respondent shall record the revised Environmental Covenant as approved by U.S. EPA, with the Recorder of Deeds, Cook County, Illinois.

XI. ACCESS TO INFORMATION

- 28. Respondent shall provide to U.S. EPA, upon request, copies of all documents and information within its possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to U.S. EPA, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.
- 29. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to U.S. EPA under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by U.S. EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to U.S. EPA, or if U.S. EPA has notified Respondent that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondent.
- 30. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, Respondent shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

31. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydro geologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XII. RECORD RETENTION

- 32. Until 6 years after Respondent's receipt of U.S. EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondent shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 6 years after Respondent's receipt of U.S. EPA's notification pursuant to Section XXVII (Notice of Completion of Work), Respondent shall also instruct its contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work.
- 33. At the conclusion of this document retention period, Respondent shall notify U.S. EPA at least 60 days prior to the destruction of any such records or documents, and, upon request by U.S. EPA, Respondent shall deliver any such records or documents to U.S. EPA. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.
- 34. Respondent hereby certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by U.S. EPA or the State and that it has fully complied and will fully comply with any and all U.S. EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XIII. COMPLIANCE WITH OTHER LAWS

35. Respondent shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARS") under federal environmental or state environmental or facility siting laws. Respondent shall identify ARARS in the Work Plan subject to U.S. EPA approval.

XIV. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

- 36. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the OSC or, in the event of his/her unavailability, the Regional Duty Officer, Emergency Response Branch, Region 5 at (312) 353-2318, of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and U.S. EPA takes such action instead, Respondent shall reimburse U.S. EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVI (Payment of Response Costs).
- 37. In addition, in the event of any release of a hazardous substance from the Site, Respondent shall immediately notify the OSC at (312) 353-2318 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to U.S. EPA within 7 business days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, et seq.

XV. AUTHORITY OF ON-SCENE COORDINATOR

38. The OSC shall be responsible for overseeing Respondent's implementation of this Settlement Agreement. The OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of the OSC from the Site shall not be cause for stoppage of work unless specifically directed by the OSC.

XVI. PAYMENT OF RESPONSE COSTS

39. Payment for Response Costs.

- a. Respondent shall pay U.S. EPA all Response Costs not inconsistent with the NCP. On a periodic basis, U.S. EPA will send Respondent a bill requiring payment that consists of an Itemized Cost Summary. Respondent shall make all payments within 30 calendar days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 41 of this Settlement Agreement. Payment shall be made to U.S. EPA by Electronic Funds Transfer ("EFT") in accordance with current EFT procedures to be provided to Respondent by U.S. EPA Region 5, and shall be accompanied by a statement identifying the name and address of the party making payment, the Lindsay Light II Site OU 18 name, and Site/Spill ID Number 05YT, and the U.S. EPA docket number for this action.
- b. At the time of payment, Respondent shall send notice that such payment has been made to the Director, Superfund Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois, 60604-3590 and to Mary L. Fulghum, Associate Regional Counsel, 77 West Jackson Boulevard, C-14J, Chicago, Illinois, 60604-3590.
- c. All amounts to be paid by Respondent pursuant to Paragraph 39 shall be deposited in the Lindsay Light II Special Account within the U.S. EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by U.S. EPA to the U.S. EPA Hazardous Substance Superfund.
- 40. In the event that the payment for Response Costs is not made within 30 days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance. The Interest on Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XIX.

41. Respondent may dispute all or part of a bill for Response Costs submitted under this Settlement Agreement, only if Respondent alleges that U.S. EPA has made an accounting error, or if Respondent alleges that a cost item is inconsistent with the NCP. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondent shall pay the full amount of the uncontested costs to U.S. EPA as specified in Paragraph 39 on or before the due date. Within the same time period, Respondent shall pay the full amount of the contested costs into an interest-bearing escrow account. Respondent shall simultaneously transmit a copy of both checks to the persons listed in Paragraph 39(b) above. Respondent shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which it prevailed from the escrow funds plus interest within 20 calendar days after the dispute is resolved.

XVII. <u>DISPUTE RESOLUTION</u>

- 42. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.
- 43. If Respondent objects to any U.S. EPA action taken pursuant to this Settlement Agreement, including billings for Response Costs, it shall notify U.S. EPA in writing of its objection(s) within 10 calendar days of such action, unless the objection(s) has/have been resolved informally. This written notice shall include a statement of the issues in dispute, the relevant facts upon which the dispute is based, all factual data, analysis or opinion supporting Respondent's position, and all supporting documentation on which such party relies. U.S. EPA shall provide its Statement of Position, including supporting documentation, no later than 10 calendar days after receipt of the written notice of dispute. In the event that these 10-day time periods for exchange of written documents may cause a delay in the work, they shall be shortened upon, and in accordance with, notice by U.S. EPA. The time periods for exchange of written documents relating to disputes over billings for response costs may be extended at the sole discretion of U.S. EPA. An administrative record of any dispute under this Section shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, and the Statement of Position served pursuant to the preceding paragraph. Upon review of the administrative record, the Director of the Superfund Division, U.S. EPA Region 5, shall resolve the dispute consistent with the NCP and the terms of this Settlement Agreement.
- 44. Respondent's obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with U.S. EPA's decision, whichever occurs.

XVIII. FORCE MAJEURE

- 45. Respondent agrees to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a force majeure. For purposes of this Settlement Agreement, a force majeure is defined as any event arising from causes beyond the control of Respondent, or of any entity controlled by Respondent, including but not limited to its contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondent's best efforts to fulfill the obligation. Force majeure does not include financial inability to complete the Work or increased cost of performance.
- 46. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondent shall notify U.S. EPA orally within 24 hours of when Respondent first knew that the event might cause a delay. Within 7 calendar days thereafter, Respondent shall provide to U.S. EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a *force majeure* event if Respondent intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall be grounds for U.S. EPA to deny Respondent an extension of time for performance. Respondent shall have the burden of demonstrating by a preponderance of the evidence that the event is a <u>force majeure</u>, the delay is warranted under the circumstances, and best efforts were exercised to avoid and mitigate the effects of the delay.
- 47. If U.S. EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by U.S. EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If U.S. EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, U.S. EPA will notify Respondent in writing of its decision. If U.S. EPA agrees that the delay is attributable to a *force majeure* event, U.S. EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XIX. STIPULATED PENALTIES

48. Respondent shall be liable to U.S. EPA for stipulated penalties in the amounts set forth in Paragraphs 49 and 50 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVIII (Force Majeure). "Compliance" by Respondent shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of this Settlement Agreement within the specified time schedules established by and approved under this Settlement Agreement.

49. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 49(c) (i), ii, or iii:

Violation Per Day	Period of Noncompliance
\$500.00	1 st through 14 th day
\$2,000.00	15 th through 30 th day
\$5,000.00	31st day and beyond

b. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 49(c)(iv):

1st Violation- Per Day Penalty	Period of Noncompliance
\$ 500.00	1 st day
\$ 1,000.00	2 nd day
\$ 1,500.00	3 rd through 5 th day
\$ 3,500.00	6 th through 15 th day
\$ 7,500.00	16th day and beyond
2nd Violation- Per Day Penalty	Period of Noncompliance
2nd Violation- Per Day Penalty \$ 1,500.00	Period of Noncompliance 1 st day
\$ 1,500.00	1 st day
\$ 1,500.00 \$ 2,250.00	1 st day 2 nd day
\$ 1,500.00 \$ 2,250.00 \$ 3,500.00	1 st day 2 nd day 3 rd through 5 th day

3 rd or More Violation Per Day Penalty	Period of Noncompliance
\$ 2,500.00	1 st day
\$ 4,000.00	2 nd day
\$ 7,500.00	3 rd through 5 th day
\$12,500.00	6 th through 15 th day
\$20,000.00	16 th day and beyond

c. Compliance Milestones

- i. Payment of Response Costs due 30 days after the Respondent's receipt of U.S. EPA's billing statement.
- ii. Recording the Environmental Covenant within 30 calendar days after completion of all Work required by Section VIII of this Settlement Agreement.
- iii. Submit to U.S. EPA a draft map and a final revised map of the Uninvestigated Site Area in accordance with the Work Plan.
- iv. 72-hour advance notice of intrusive work in Uninvestigated Site Area as required in Paragraph 25b.
- 50. <u>Stipulated Penalty Amounts Reports</u>. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports or other written documents pursuant to Paragraphs 19 and 20:

Violation Per Day	Period of Noncompliance
\$250.00	1 st through 14 th day
\$500.00	15 th through 30 th day
\$3000.00	31st day and beyond

51. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after U.S. EPA's receipt of such submission until the date that U.S. EPA notifies Respondent of any deficiency; and 2) with respect to a decision by the Director of the Superfund Division, Region 5, under Paragraph 43 of Section XVII (Dispute Resolution), during the period, if any, beginning on the 21st day after U.S. EPA submits its written statement of position until the date that the Director of the Superfund Division

issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

- 52. Following U.S. EPA's determination that Respondent has failed to comply with a requirement of this Settlement Agreement, U.S. EPA shall give Respondent written notification of the failure and describe the noncompliance. U.S. EPA may send Respondent a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether U.S. EPA has notified Respondent of a violation.
- 53. All penalties accruing under this Section shall be due and payable to U.S. EPA within 30 days of Respondent's receipt from U.S. EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XVII (Dispute Resolution). All payments to U.S. EPA under this Section shall be paid by certified or cashier's check made payable to "U.S. EPA Hazardous Substances Superfund," shall be mailed to U.S. Environmental Protection Agency, Program Accounting & Analysis Section, P.O. Box 70753, Chicago, Illinois 60673, shall indicate that the payment is for stipulated penalties, and shall reference the U.S. EPA Site/Spill ID Number 05YT OU 18, the U.S. EPA Docket Number, and the name and address of the party making payment. Copies of any check paid pursuant to this Section, and any accompanying transmittal letters, shall be sent to U.S. EPA as provided in Paragraph 39(b).
- 54. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Settlement Agreement.
- 55. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 20 days after the dispute is resolved by agreement or by receipt of U.S. EPA's decision.
- 56. If Respondent fails to pay stipulated penalties when due, U.S. EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 53. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of U.S. EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(l) of CERCLA, 42 U.S.C. §§ 9606(b) and 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that U.S. EPA shall not seek civil penalties pursuant to Section 106(b) or 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement Agreement. Should Respondent violate this Settlement Agreement or any portion hereof, U.S. EPA may carry out the required

actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. §9604, and/or may seek judicial enforcement of this Settlement Agreement pursuant to Section 106 of CERCLA, 42 U.S.C. §9606. Notwithstanding any other provision of this Section, U.S. EPA may, in its unreviewable discretion, waive in writing any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XX. COVENANT NOT TO SUE BY U.S. EPA

57. In consideration of the actions that will be performed and the payments that will be made by Respondent under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, U.S. EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a) for the Work and Response Costs. This covenant not to sue shall take effect upon receipt by U.S. EPA of the Response Costs due under Section XVI of this Settlement Agreement and any Interest or Stipulated Penalties due for failure to pay Response Costs as required by Sections XVI and XIX of this Settlement Agreement. This covenant not to sue is conditioned upon the complete and satisfactory performance by Respondent of its obligations under this Settlement Agreement, including, but not limited to, payment of Response Costs pursuant to Section XVI. This covenant not to sue extends only to Respondent and does not extend to any other person.

XXI. RESERVATIONS OF RIGHTS BY U.S. EPA

- 58. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of U.S. EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent U.S. EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement. U.S. EPA also reserves the right to take any other legal or equitable action as it deems appropriate and necessary, or to require the Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.
- 59. The covenant not to sue set forth in Section XX above does not pertain to any matters other than those expressly identified therein. U.S. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:
- a. claims based on a failure by Respondent to meet a requirement of this Settlement Agreement;

- b. liability for costs not included within the definition of Response Costs;
- c. liability for performance of response action other than the Work;
- d. criminal liability;
- e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments; and
- f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site.
- 60. Work Takeover. In the event U.S. EPA determines that Respondent have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, U.S. EPA may assume the performance of all or any portion of the Work as U.S. EPA determines necessary. Prior to taking over the Work, U.S. EPA will issue written notice (including electronic mail) to Respondent specifying the grounds upon which such notice was issued and, to the extent U.S. EPA determines there is no imminent or ongoing threat to human health or the environment, the notice will provide Respondent ten days within which to remedy the circumstances giving rise to U.S. EPA's issuance of the notice. Respondents may invoke the procedures set forth in Section XVI (Dispute Resolution) to dispute U.S. EPA's determination that takeover of the Work is warranted under this Paragraph. However, notwithstanding Respondent's invocation of such dispute resolution procedures, and during the pendency of any such dispute, U.S. EPA may in its sole discretion commence and continue a Work Takeover until the earlier of (1) the date that Respondent remedies, to U.S. EPA's satisfaction, the circumstances giving rise to U.S. EPA's issuance of the relevant Work Takeover Notice, or (2) the date that a final decision is rendered in accordance with Paragraph 45 requiring U.S. EPA to terminate such Work Takeover. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Response Costs that Respondents shall pay pursuant to Section XVI (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, U.S. EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANT NOT TO SUE BY RESPONDENT

61. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Response Costs, or this Settlement Agreement, including, but not limited to:

- a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;
- b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Illinois State Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or
- c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Site.

These covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraphs 59 (b), (c), and (e) - (f), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

Respondent reserves, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on U.S. EPA's selection of response actions, or the oversight or approval or disapproval of Respondent's plans, reports, other deliverables, work or activities.

62. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXIII. OTHER CLAIMS

63. By issuance of this Settlement Agreement, the United States and U.S. EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or U.S. EPA shall not be deemed a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

- 64. Except as expressly provided in Section XX (Covenant Not to Sue by U.S. EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.
- 65. No action or decision by U.S. EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIV. CONTRIBUTION

- 66. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Respondent is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work and Response Costs.
- b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42. U.S.C. § 9613(f)(3)(B), pursuant to which the Respondent has, as of the Effective Date, resolved its liability to the United States for the Work and Response Costs.
- c. Nothing in this Settlement Agreement precludes the United States or Respondent from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing herein diminishes the right of the United States, pursuant to Section 113(f)(2) and (3), 42 U.S.C. § 9613(f)(2) and (3), to pursue any such persons to obtain additional response costs or response action, and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2).

XXV. <u>INDEMNIFICATION</u>

- 67. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondent agrees to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondent in carrying out activities pursuant to this Settlement Agreement. Neither Respondent nor any such contractor shall be considered an agent of the United States. The Federal Tort Claims Act (28 U.S.C. §§ 2671, 2680) provides coverage for injury or loss of property, or injury or death caused by the negligent or wrongful act or omission of an employee of U.S. EPA while acting within the scope of his or her employment, under circumstances where U.S. EPA, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred.
- 68. The United States shall give Respondent notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondent prior to settling such claim.
- 69. Respondent waives all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondent shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXVI. INSURANCE

70. At least 10 days prior to commencing any on-Site work under this Settlement Agreement, Respondent shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance with limits of two (2) million dollars and automobile insurance with limits of one (1) million dollars, combined single limit, naming U.S.

EPA as an additional insured. Within the same time period, Respondent shall provide U.S. EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement Agreement, Respondent shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondent in furtherance of this Settlement Agreement. If Respondent demonstrates by evidence satisfactory to U.S. EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent needs to provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVII. MODIFICATIONS

- 71. The OSC may make modifications to any plan or schedule in writing or by oral direction. Any oral modification will be memorialized in writing by U.S. EPA promptly, but shall have as its effective date the date of the OSC's oral direction. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.
- 72. If Respondent seeks permission to deviate from any approved work plan or schedule, Respondent's Project Coordinator shall submit a written request to U.S. EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to Paragraph 71.
- 73. No informal advice, guidance, suggestion, or comment by the OSC or other U.S. EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVIII. NOTICE OF COMPLETION OF WORK

74. When U.S. EPA determines, after U.S. EPA's review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including, e.g., post-removal site controls, payment of Response Costs, and record retention, U.S. EPA will provide written notice to Respondent. If U.S. EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, U.S. EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modifies the Work Plan if appropriate in order to correct such deficiencies. Respondent shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the U.S. EPA notice. Failure by Respondent to implement the approved modified Work Plan shall be a violation of this Settlement Agreement.

XXIX. NOTICES AND SUBMISSIONS

75. Whenever, under the terms of this Agreement, notice is required to be given or a document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of this Agreement with respect to U.S. EPA and Respondent.

As to U.S. EPA:

Mary L. Fulghum Cathleen M. Martwick Associate Regional Counsel U.S. EPA (C-14J) 77 W. Jackson Blvd. Chicago, Illinois 60604

Verneta Simon, P.E. On-Scene Coordinator U.S. EPA (SE-6J) 77 W. Jackson Blvd. Chicago, Illinois 60604

Gene Jablonowski Project Manager U.S. EPA (SR-6J) 77 W. Jackson Blvd. Chicago, Illinois 60604

Vanessa Mbogo Comptroller's Office U.S. EPA (MF-10J) 77 W. Jackson Blvd. Chicago, Illinois 60604

As to Respondent:

c/o Related Midwest 350 W. Hubbard Street Suite 300 Chicago, Illinois 60610 Attn: Don Biernacki Lindsay Light II OU 18, 515 N. Peshtigo Ct. Admin. Settlement Agreement and Order on Consent for Removal Action

XXX. INTEGRATION/EXHIBITS

76. This Settlement Agreement and its Exhibit constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following Exhibit is incorporated into this Settlement Agreement:

Exhibit A Site Map.

XXXI. EFFECTIVE DATE

77. This Settlement Agreement shall be effective upon signature of this Settlement by the Director, Superfund Division, U.S. EPA Region 5.

Lindsay Light II OU 18, 515 N. Peshtigo Ct. Admin. Settlement Agreement and Order on Consent for Removal Action

The undersigned representative of Respondent certifies that s/he is fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind the party s/he represents to this document.

Agreed this $\frac{30+h}{4}$ day of $\frac{4\sqrt{9v5+}}{2011}$, 2011.

For Respondent Related BIT 500 Lakeshore Owner LLC:

By:

DON BIERNACKI

Title: Authorized Representative

 Lindsay Light II OU 18, 515 N. Peshtigo Ct. Admin. Settlement Agreement and Order on Consent for Removal Action

IN THE MATTER OF:

Lindsay Light II, OU 18 515 North Peshtigo Court Chicago, Illinois

It is so ORDERED and Agreed this 2 day of Goffender, 2011.

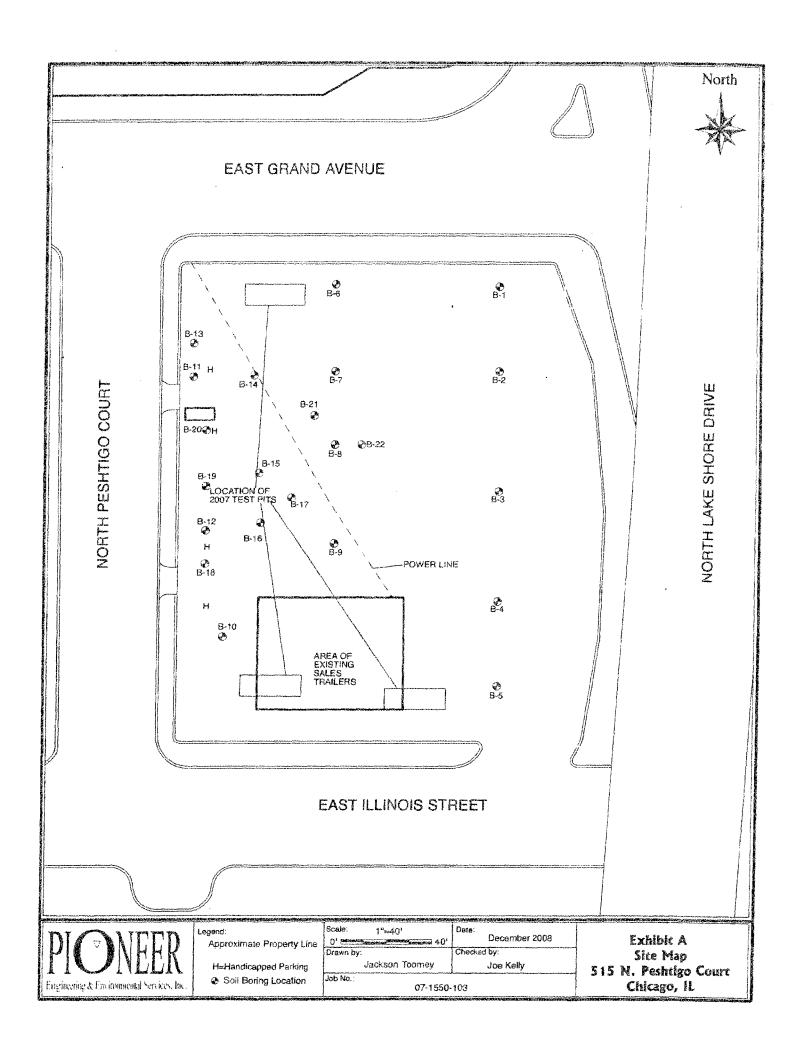
BY:

Richard C. Karl, Director

FE Superfund Division

United States Environmental Protection Agency

Region 5



Appendix B

Historical Radiological Survey Reports

STS Surface Gamma Survey - November 20, 2000



November 20, 2000

Mr. Kevin Augustyn MCL Companies 455 E. Illinois Street, Suite 565 Chicago, Illinois 60611

RE: Radiation Survey of Three Parking Lots in the Vicinity of the Former Kraft Building, Chicago, Illinois – STS Project No. 1-24418-XO

Dear Mr. Augustyn:

In response to your request, STS Consultants, Ltd. (STS) has completed a walkover gamma radiation of three surface parking lots as described below (see Figure 1):

- West Lot Bounded by McClurg Court on the west, Illinois Street on the south, Grand Avenue on the north, and the former Kraft Building on the east.
- North Lot Bounded by the West Lot on the west, Grand Avenue on the north, and the former Kraft Building on the south and east.
- Peshtigo Lot Bounded by Peshtigo Street on the west, by Illinois Street on the south, Grand Avenue on the north, and Lake Shore Drive on the east.

Over the past approximately seven years, several properties in the vicinity of the subject parcels have been found to contain materials which exhibit elevated gamma radiation. The radiation is apparently the result of thorium-impacted soil from the manufacture of gas lantern mantles on vicinity properties in the 1910s through the mid-1930s. While there is no evidence that the activities which resulted in contamination on the vicinity properties occurred on the subject parcels, we understand MCL/River East requested these surveys to assess potential concerns regarding impacts on future development plans. Additionally, the U.S. Environmental Protection Agency (USEPA) has requested properties in the vicinity of the previously identified impacted properties be surveyed to mitigate potential impacts or increased exposure potential if and when the properties are developed. A copy of the USEPA correspondence requesting these surveys is attached (Appendix A).

SCOPE OF WORK

The parking lots were surveyed over a three day period. Representatives from the USEPA were present during the majority of the survey field time. The surveys were for the purpose of measuring for elevated gamma radiation. The surveys consisted of two components, a gamma measurement on a 5 meter grid and a gamma scan for elevated readings within each 5 meter grid cell.

MCL Companies STS Project No. 1-24418-XO November20, 2000 Page 2

The surveys were conducted with a 2 x 2 NaI gamma detector (Ludlum 2221). The probe was unshielded to provide for broader area screening. Thirty second counts at the grid corners were normalized to counts per minute (cpm). Appendices B, C, and D present the field survey results for the West Lot, North Lot and Peshtigo Lot.

Several factors influence the survey results in addition to the presence or absence of thorium-impacted soil. The presence of pavement acts as shielding, and can significantly reduce or preclude radiation detections based on surface readings. While it is not an equivalent reading due to the shielding afforded by the pavement, readings above 21,000 cpm on exposed soil are indicative of thorium-impacted soil on vicinity properties. Readings on the order of twice background are considered suspect of potential contamination.

Brick is known to exhibit levels of gamma radiation somewhat above typical soil values. The presence of brick debris in buried fill, brick walls below ground, or areas near brick walls or buildings can have survey values elevated above typical background values. Unless the brick structure is above grade, it may be necessary to conduct subsurface exploration to assess anomalous elevated readings.

Other materials such as scale in gas or water pipes, granite paving stones or building facades can produce anomalous high results. Sampling and analysis may be required to resolve some anomalous readings if no obvious source is evident.

FINDINGS

West Lot

One location on the West Lot measured elevated gamma readings which strongly suggest the possibility of thorium-impacted soil. A maximum reading of over 80,000 cpm through the pavement was noted (cell 10 to 15 meters south of Grand Avenue sidewalk, and cell 20 to 25 meters east of McClurg Court sidewalk). This reading is sufficiently high so as to exceed the value for the clean-up threshold when in direct contact with that soil.

The readings across this parking lot also show a trend of high readings toward the south, particularly at the southeast corner. Background values, those which appear typical of the low range of readings, i.e., below the mid-range or mean for the site are from 4,650 to 6,800 cpm. The highest readings outside of the area of apparent contamination are from 10,000 to a maximum of 13,000, west of the west end of the Kraft Building. These values are on the order of twice background and may indicate elevated readings from brick fill in the subsurface; the affects of "shine", radiation from the bricks in the adjacent building; or may be an indication of thorium-impacted soil. Exploration and direct surveys will likely be necessary to resolve this uncertainty.

MCL Companies STS Project No. 1-24418-XO November20, 2000 Page 3

North Lot

The North Lot did not exhibit an area with distinct indications of impairment as noted in the West Lot. In general the readings increased from west to east, from 5,000 to 6,000 cpm at the west to 7,000 to 10,000 cpm at the east.

There was a similar trend toward higher readings from north to south with 5,000 cpm readings typical of the north edge and 8,000 cpm values near the building to the south. The highest reading was 12,000 cpm adjacent to the building.

Background for this parking lot, using the lower half of the readings as typical of background is 5,000 to 6,500 cpm. The highest readings are near the east end of the lot, and may be the result of "shine" from brick on the building which is both east and south of the parking lot at this location. Subsurface exploration would be necessary to confidently demonstrate the source of these readings as being either material in the subsurface or an artifact of proximity to the building.

Peshtigo Lot

The survey of the Peshtigo Lot showed very consistent readings, ranging from a low of mid-4,000 cpm to a high of 8,000 cpm. Only 6 readings were above 7,000 cpm, all along the southwest or western edges of the parcel.

Over half of the readings are below 6,000 cpm. This consistent low value may be indicative of a thick uniform cover of pavement or of low radioactivity in the subsurface. The readings across this lot show no values twice the lowest reading on-site, and none approaching twice the apparent background value, i.e., the value of the lower half of the readings on-site, 4,600 to 5,850 cpm.

CONCLUSIONS

The surveys of the three parking lots identified one location which appears to be underlain by soil or fill with elevated gamma radiation. The survey readings are sufficiently high at the location near the center of the north portion of the West Lot, so as to exceed the clean-up threshold for the vicinity properties. That clean-up threshold is specified by USEPA on vicinity properties as 7.1 picoCuries per gram (pCi/g) total radium (Ra 226 + Ra 228). Direct contact soil readings for soil at 7.1 pCi/g are 21,000 cpm. The readings on the location in the West Lot were 80,000 cpm through the asphalt pavement. Subsurface exploration would be required to assess the apparent limits of the impacted soil.

Other readings showed some elevated gamma values, particularly across the middle of the West Lot and toward the southeast corner of the West Lot. Similar high values were noted toward the east end of the North Lot. These locations, however, may be exhibiting higher

MCL Companies STS Project No. 1-24418-XO November20, 2000 Page 4

gamma counts due to the proximity of a brick building rather than impacted soil. Subsurface exploration would be required to resolve the uncertainty. The Peshtigo Lot showed low and very consistent gamma readings. No indication of impacts was evident at the Peshtigo Lot.

This report presents the findings and conclusions of the surveys conducted as described herein. It must be recognized that impacts may be present beyond those identified in this survey, and are not apparent due to shielding provided by soil and/or pavement cover. No warranty, either explicit or implied, is intended in this report regarding the environmental conditions on the subject properties.

On the basis of the USEPA request for survey results on vicinity properties, and their presence during the surveys, it is recommended that this report be provided to the USEPA at the following address:

Ms. Verneta Simon, On-Scene Coordinator Mr. Fred Micke, On-Scene Coordinator U. S. Environmental Protection Agency Region 5 77 W. Jackson Blvd., SE-5J Chicago, IL 60604

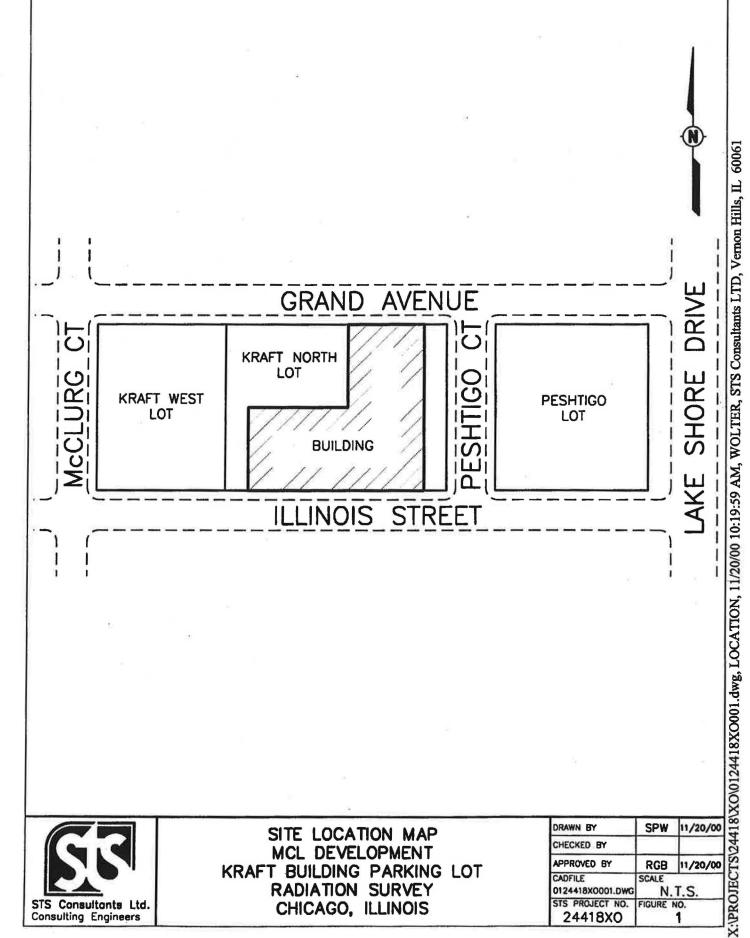
We appreciate being of service to River East and MCL Companies. Please contact us with any questions you may have regarding this report.

Regards,

STS CONSULTANTS, LTD.

Richard G. Berggreen, C.P.G.

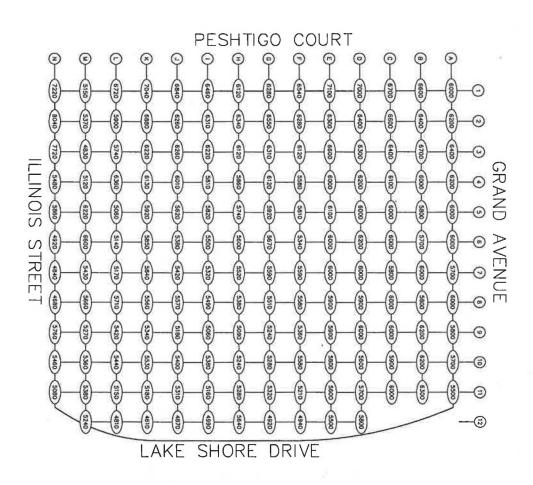
Principal Geologist





SITE LOCATION MAP MCL DEVELOPMENT KRAFT BUILDING PARKING LOT RADIATION SURVEY CHICAGO, ILLINOIS

DRAWN BY	SPW	11/20/00
CHECKED BY		
APPROVED BY	RGB	11/20/00
CADFILE 0124418X0001.DWG	SCALE	
STS PROJECT NO. 24418XO		

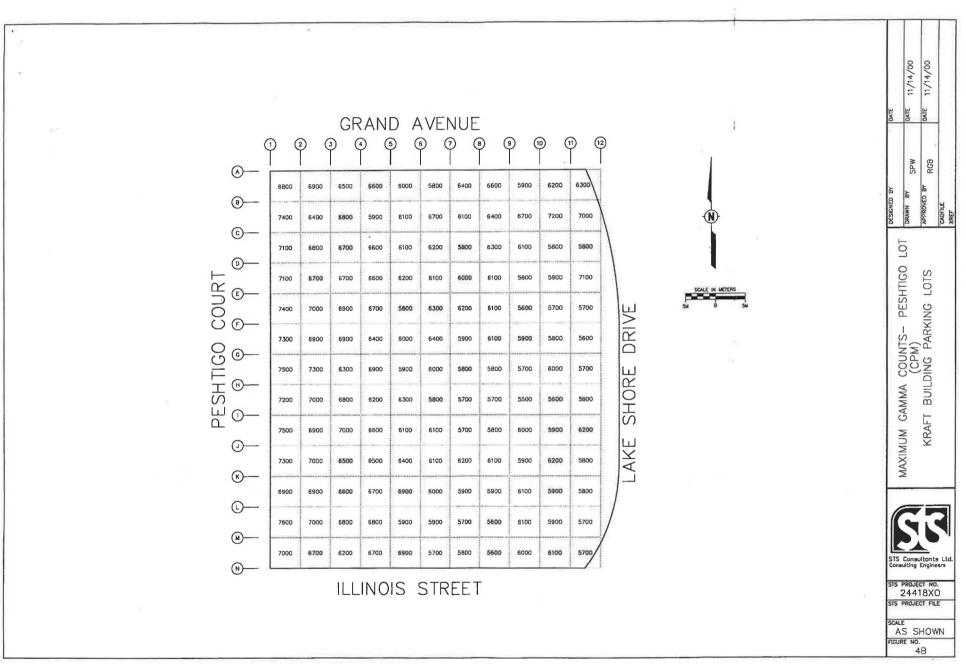




STS PROJECT FILE
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GRID CORNER GAMMA— PESHTIGO LOT COUNTS (CPM) KRAFT BUILDING PARKING LOTS

DESIGNED BY	DATE
DRAWN BY SPW	DATE 11/14/00
APPROVED BY RGB	DATE 11/14/00



X:PROJECTS/24418\XO\0124418XO001.dwg, PESHTIGO FIG 3, 11/17/00 02:47:36 PM, WOLTER, STS Consultants LTD, Vernon Hills, IL 60061

RSSI Down-hole Gamma and Soil Spectroscopy Results Report – December 23, 2008

SUBSURFACE RADIATION MEASUREMENTS
AT 515 NORTH PESHTIGO COURT
CHICAGO, ILLINOIS
PERFORMED ON
AUGUST 11 - 12, 2008
AND
OCTOBER 14, 2008

FOR

PIONEER ENGINEERING & ENVIRONMENTAL SERVICES, INC. 700 NORTH SACRAMENTO BLVD, SUITE 101 CHICAGO, ILLINOIS

BY

RSSI

6312 W. OAKTON STREET MORTON GROVE, ILLINOIS

December 23, 2008

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I. INTRODUCTION

In the early 1900s, Lindsay Light and Chemical Company refined and used thorium in industrial operations between Illinois Street and Grand Avenue east of Michigan Avenue, in Chicago's Streeterville area. Thorium is naturally radioactive. The predominate isotope of thorium, thorium-232 (Th-232), decays to radium-228 (Ra-228). Another isotope, thorium-230 (Th-230), decays to radium-226 (Ra-226).

The US Environmental Protection Agency (EPA) reported that the material from Lindsay Light and Chemical Company refining operations may have been in fill used throughout the Streeterville area. The property at 515 North Peshtigo Court, Chicago, Illinois is located in Streeterville and was assessed to address this concern. The EPA has set a standard of 5 picocuries per gram (pCi/g) of Ra-226 plus Ra-228 above background concentrations. Background concentrations in the Streeterville area are assumed by the EPA to be 2.1 pCi/g of combined Ra-226 and Ra-228 resulting in an action level of 7.1 pCi/g combined Ra-226 and Ra-228.

II. METHODOLOGY

Borehole Radiation Level Measurements

On August 11 - 12, 2008, borehole radiation levels were measured at twelve locations selected by Pioneer. On October 14, 2008, radiation levels were measured in ten additional boreholes. Borehole locations are in Appendix A. Borehole measurements were performed using a Ludlum Model 2200 scaler ratemeter equipped with a Ludlum model 44-10 (Model 44-10) scintillation detector. No shielding was used for down-hole measurements to maximize the response to photons from all directions. Borehole measurement results are in Appendix B.

The Ludlum Model 2200 is a scaler, ratemeter and Single Channel Analyzer with a timer and adjustable high voltage, threshold and window. It is used with a Ludlum Model 44-10 scintillation detector. The Model 44-10 is a thallium doped sodium iodide (NaI(T1)) gamma scintillator coupled to photomultiplier tube (PMT). Gamma scintillation detectors are sensitive to photons

and are used to identify and quantify gamma emitting radionuclides.

The instrument was calibrated in simulated boreholes with a known concentration of thorium from the uranium and thorium series in monazite sands. The radionuclides in the series are in equilibrium with their daughters which include Ra-226 and Ra-228. The instrument response was approximately 2,300 cpm per pCi/g of Ra-226 and Ra-228 in an extended homogenous source. An instrument response of 11,500 cpm above background (See Section III) corresponds to approximately 5 pCi/g.

Soil Analysis

Ten soil samples were collected on August 11 - 12, 2008, in 500 ml Marinelli containers from the boreholes at the depth of the maximum radiation level in each borehole. The scope of the work limited initial sample collection to soil from 10 boreholes. samples were collected from two boreholes, BH-4 and BH-7. Borehole BH-4 was only 3 feet in depth and did not produce enough soil for a sample. No significant elevated radiation levels were measured in borehole BH-7. Samples were collected on October 14, 2008, from ten additional boreholes at the depth of the maximum radiation level in each borehole. Samples were counted for one hour on an Ortec DART high-resolution gamma spectroscopy system. The client requested recounting the sample collected from BH-8, because the initial concentration of radium surrogates, 4.7 pCi/g, had potential to increase to over 7.1 pCi/q after ingrowth of radon daughters.

The DART gamma spectrometer is an 8k channel, multichannel analyzer (MCA). The DART provides all functionality required to support a high purity germanium (HPGe) detector in a gamma spectrometer system. The DART system includes a computer controlled amplifier, a bias supply, a spectrum stabilizer, an analog-to-digital circuit, data memory, and a ratemeter. It is used with an Ortec GEM-30185 HPGe detector and Maestro-32 MCA Emulator Software. Data are reduced using Quantum Technology GDR gamma spectroscopy software. This system performs qualitative and quantitative analysis of spectra from the HPGe detector, identifying radionuclides and the quantities of each present in samples.

The samples were analyzed using GDR software for the uranium series, thorium series, and naturally occurring potassium-40 (K-

40). Radium-228 (Ra-228) from the thorium series emits no significant photons. Radium-226 (Ra-226) from the uranium series has only one significant photon at 186 keV and its abundance is low, 0.03. These properties make identification and quantification of the isotopes of radium unlikely with normal counting protocols.

The concentrations of surrogates with more abundant high energy photons usually represent the concentration of Ra-226 and Ra-228. Actinium-228 (Ac-228), in the thorium series, is used as a surrogate for Ra-228, and Lead-214 (Pb-214), in the uranium series, is used as a surrogate for Ra-226.

Ra-228 remains in equilibrium with Ac-228 when samples are collected. The equilibrium between Ra-226 and Pb-214 may be disturbed during sample collection because an intermediate progeny, Rn-222 is a gas and some Rn-222 may escape the sample during collection. Equilibrium is reestablished within seven to ten half-lives of Rn-222, which has a half-life of 3.8 days. Results from samples analyzed immediately after collection may underestimate the concentration of Ra-226. In the standard analysis protocol for Ra-226, samples are held for a 30-day ingrowth period to reestablish equilibrium.

Because Ac-228 remains in equilibrium with Ra-228, the only ingrowth is in Pb-214. Little change in the total activity of radium surrogates is expected in samples when the Pb-214 concentration is significantly lower than the Ac-228 concentration and when much of the Rn-222 remains entrained in the interstices of the soil matrix.

Several parameters are set in the GDR software. The sensitivity discriminates against statistically poor peaks. With a lower sensitivity, smaller and less defined peaks can be recognized. The GDR default value of 0.2 is used. The low energy cutoff sets the value below which energies will not be considered in the peak search routine. The low energy cutoff is set to 35 keV because of fall off in detector response at low energy. The library energy tolerance determines how close a peak energy must be to a library energy to identify the peak for activity reporting. The library energy tolerance is set to 1.2 keV. The gamma fraction limit specifies the fraction of secondary peaks that must be present in the spectrum to recognize a radionuclide. The gamma fraction limit is set to 10%.

Equipment survey

Drilling and other equipment used for soil boring was surveyed using a Ludlum Model 3 survey meter with a 44-9 pancake probe at the end of each workday. The Ludlum Model 3 is a general purpose portable survey instrument. It is used with a Ludlum Model 44-9 pancake type Geiger-Mueller (GM) detector. The Model 44-9 is sensitive to alpha and beta radiation emitted by the uranium series and thorium series and has limited sensitivity to photons.

III. RESULTS

Borehole Radiation Level Measurement Results

The background radiation level with the Ludlum 2200 was approximately 3,000 cpm during the survey on August 11 and 12, corresponding to an instrument response of 14,500 cpm in an extended homogenous source or 5 pCi/g Ra-226 plus Ra-228. On October 14, the background reading was approximately 5,000 cpm, corresponding to an instrument response of 16,500 cpm in an extended homogenous source of 5 pCi/g Ra-226 plus Ra-228. The maximum observed instrument response was 31,615 cpm in BH-17 at a depth of 5 ft, corresponding to approximately 11.3 pCi/g if the probe was in an extended homogenous source. The results of down-hole measurements are in Appendix B.

Soil Analysis Results

With the exception of the sample collected from BH-8, the sum of the Ac-228 and Pb-214 in the samples collected on August 11, 2008 and August 12, 2008 was not expected to be in excess of 7.1 pCi/g after ingrowth. The highest initial concentration of Ac-228 plus Pb-214 was 4.7 pCi/g in a sample collected from BH-8 at a depth of 4 ft- 6 ft. After allowing for radon daughter ingrowth, the concentration rose to a total of 5.0 pCi/g, below the EPA action level of 7.1 pCi/g. Samples are identified as SBnn. They were collected from boreholes BHnn, where nn is the sample number. The high-resolution gamma spectroscopy analyses of the boring samples are provided in Appendix D.

Equipment Survey Results

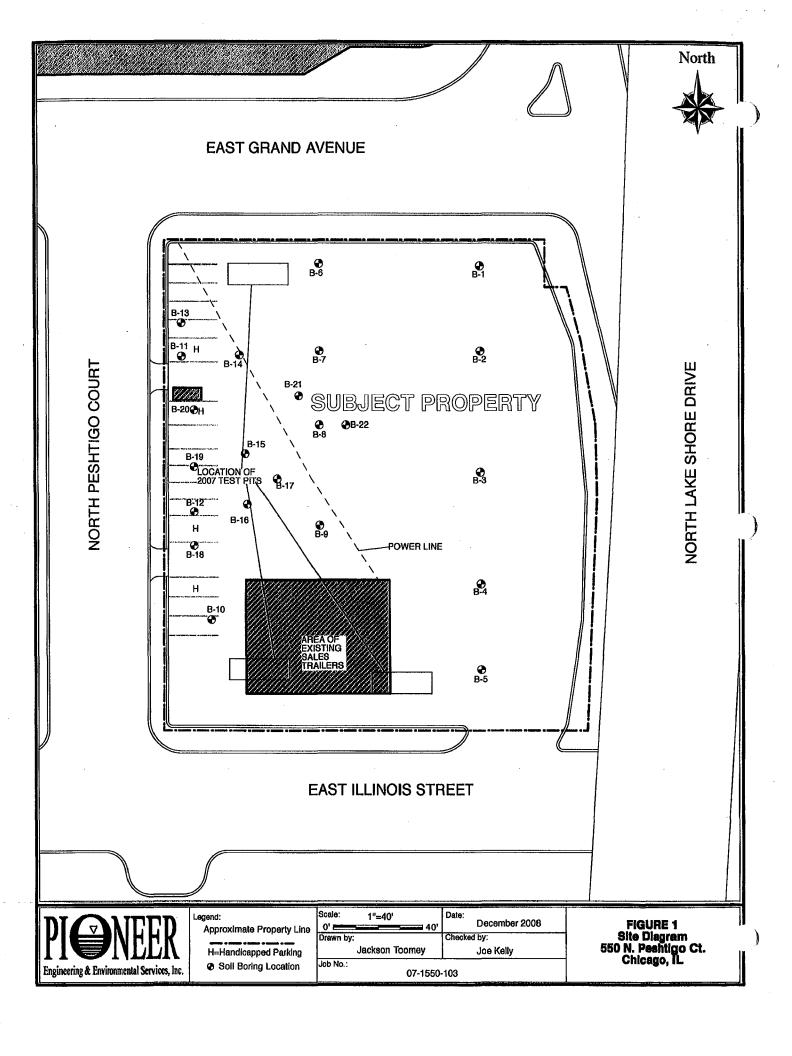
The background radiation level with the Ludlum 3 was 50 cpm. Surveyed equipment radiation levels were indistinguishable from background. Equipment survey results are in Appendix C.

IV. CONCLUSIONS

None of the results for samples analyzed immediately after collection were above 7.1 pCi/g, the EPA's action level, of Ra-226 and Ra-228 surrogates. Sample SB-8 had the highest concentration of Pb-214 and was reanalyzed after allowing for Pb-214 ingrowth. After the sample was recounted, the sum of the radium surrogates was below the 7.1 pCi/g level. The instrument response in three boreholes, BH-8, BH-11, and BH-12 indicate that concentrations of radioactivity above the EPA limits may be adjacent to the boreholes. The elevated borehole screening results may also be attributable to the presence of thorium and other radionuclides in bricks and granite pavers in the Chicago fire rubble used to fill Streeterville.

APPENDIX A

Borehole locations



APPENDIX B

Borehole radiation level measurements

1

Client: Pioneer

Date:

8/11/08

Location: 515 N. Peshtigo Court

Performed By: Sangho Nam

Instrument: Ludlum 2200 S/N: 69279 Probe:

44-10

Borehole Count Rates

Depth	BH : 1	BH : 2	BH : 3
0	3996	4919	3399
1	10800	7904	4447
2	10783	15216	8269
3	9402	14781	14911
4	12643	9629	17132
5	11996	11678	1.4856
6	10760	9846	10013
7	10114	7930	9749
8	8 10487		9128
9		12023	7872
10			5298
Background	2969	2969	2969
Samples collected	4' - 6'	2' - 4'	4'- 6'

Client: Pioneer

Date:

8/11/08

Location: 515 N. Peshtigo Court Performed By: Sangho Nam

Instrument: Ludlum 2200 S/N: 69279 Probe:

44-10

Depth	BH : 4	BH : 5	BH : 6
0	4319	3739	4951
1.	5011	3256	5312
2	16571	8883	14493
, 3	14015	15510	15156
4		14515	15238
5		14196	14385
6		11694	13746
7	·	11288	12696
8			11349
9			9306
1.0			
Background	2969	2969	2969
Samples collected	No Sample	4' - 6'	2' - 4'

Client: Pioneer Date: 8/11/08
Location: 515 N. Peshtigo Court Performed By: Sangho Nam

Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Borehole Count Rates

Depth	BH : 7	BH : 8	BH : 9
0	4002	4219	4007
1	4090	4137	3841
2	10646	9929	11375
3	12157	13471	14513
4	11045	21578	11531
5	12238	18551	11718
6	11293	13015	14302
7	11531	11030	14160
8	9960	11132	12976
9	6642	8856	10742
10			
Background	Background 2969		2969
Samples collected	No Sample	4' - 6'	6'- 8'

Date: 8/11/08 - 8/12/08 Client: Pioneer

Location: 515 N. Peshtigo Court Performed By: Sangho Nam Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Depth	BH : 10	BH : 11	BH : 12	
0	4098	3730	3914	
1	8416	5187	8890	
2	15671	11571	17222	
3	15947	22282	22367	
4	15488	19745	20108	
5	12550	16685	18093	
6	12019	12611	16327	
7	10572	14447	12613	
8	8		8073	
9		15663		
10				
Background	2969	2923	2923	
Samples collected	2' - 4'	2' - 4'	2' - 4'	

Client: Pioneer Date: 10/14/2008

Location: 515 N. Peshtigo Court Performed By: Juan Correa

Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Borehole Count Rates

Depth	BH : 13	BH : 14	BH : 15	
0	4917	4976	4851	
1	6900	5142	6145	
2	20561	14313	9564	
3	20968	15637	10052	
4	22015	20338	14059	
5	18181	19777	19706	
6	19676	20100	17181	
7	18539	20424	14895	
8	18783	16389	15112	
9				
10				
Background	4853	4853	4853	
Samples collected	No Sample	No Sample	No Sample	

Client: Pioneer Date: 10/14/2008

Location: 515 N. Peshtigo Court Performed By: Juan Correa

Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Depth	BH : 16	BH : 17	BH : 18
0	4918	9477	6165
1	10201	8039	18427
2	19666	21072	29085
3	22498	17970	30975
4	20074	17625	28652
5	23172	31615	22505
6	21268	27117	20450
7	14115	18217	21234
8	12142	14252	18538
9			
10			
Background	4853	4853	4853
Samples collected	No Sample	No Sample	No Sample

Client: Pioneer Date: 10/14/2008
Location: 515 N. Peshtigo Court Performed By: Juan Correa

Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Borehole Count Rates

Depth	BH : B19	BH : B20	BH : B21
0	6595	9036	5197
1	16727	19084	13663
2	12884	20185	12710
3	12078	19355	16748
4	14881	15388	17398
5	20184	16313	18057
6	17688	15669	14877
7	18573	20340	10222
8	13171	19129	8694
9			
10			
Background	4853	4853	4853
Samples collected	4'-6'	No Sample	No Sample

Client: Pioneer Date: 10/14/2008
Location: 515 N. Peshtigo Court Performed By: Juan Correa

Instrument: Ludlum 2200 S/N: 69279 Probe: 44-10

Depth	BH : B22
0	4386
1	10052
2	18417
3	19069
4	23180
5	22344
6	15925
7	14672
8	10642
9	
10	
Background	4853
Samples collected	4'-6'

APPENDIX C

Gamma spectroscopy analysis summary table and reports

• Gamma Spectroscopy Results Summary

Sample	Borehole	Depth	Pb-214	Ac-228	TOTAL
NO.	ID	Ft	pCi/g	pCi/g	pCi/g
081941	SB-1	4 - 6	0.8	0.6	1.4
081942	SB-2	2 - 4	1.8	1.0	2.8
081943	SB-3	4 - 6	1.2	0.8	2.0
081944	SB-5	4 - 6	1.4	0.8	2.2
081945	SB-6	2 - 4	1.4	1.0	2.4
081946	SB-8	4 - 6	3.7	1.0	4.7
081946A	SB-8	4 - 6	3.9	1.1	5.0
081947	SB-9	6 - 8	1.7	1.0	2.7
081948	SB-10	2 - 4	1.6	1.1	2.7
081949	SB-11	2 - 4	1.3	0.8	2.1
081950	SB-12	2 - 4	1.5	0.8	2.3
082400	SB-13	2 - 4	1.5	1.0	2.5
082401	SB-14	4 - 6	1.1	0.8	1.9
082402	SB-15	4 - 6	1.2	0.8	2.0
082403	SB-16	4 - 6	2.3	1.2	3.5
082404	SB-17	4 - 6	3.0	0.8	3.8
082405	SB-18	2 - 4	2.5	1.0	3.5
082406	SB-19	4 - 6	1.3	0.8	2.1
082407	SB-20	2 - 4	1.4	0.9	2.3
082408	SB-21	2 - 4	0.7	0.5	1.2
082409	SB-22	4 - 6	1.9	1.2	3.1

	========		======		
GDR/PC	RSSI High	Resolution	Gamma	Spectroscopy	Ver. 6.02a

Sample ID :	081941	PTONEER	PESHTICO	SITE R-1

Sample ID: 081941 PIONEER PESHTIGO SITE B-1
Sample Size 9.44e+002 g Spectrum File . H:\MAESTROS\081941.CHN Sampling Start00-00-00 00:00 Counting Start 08-13-08 11:29 Sampling Stop00-00-00 00:00 Live Time 3600 Sec Current Date00-00-00 00:00 Real Time
Detector #: 1 Energy(keV)= 6.97 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 07-21-08 11:19
FWHM(keV) = 0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08-13-07 15:28 Where En = Sqrt(Energy in keV)
Sensitivity 0.20 Search Start / End 0 / 8191 Sigma Multiplier 1.00

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	74.80	292.85	234	51	97	643	0.83	a	
2	76.88	301.85	434	53 .	97	693	1.03	b	
3	86.84	344.84	121	46	87	644	0.86		
4	92.57	369.61	139	52	100	735	1.68		
5	185.86	772.39	314	49	90	563	1.43		
6	209.29	873.52	192	45	86	450	1.23		
7	238.52	999.74	1059	53	87	410	1.11	a	
8	241.73	1013.62	291	49	94	454	1.37	b	
9	270.26	1136.78	90	35	67	307	1.23		
10	295.04	1243.77	549	43	75	287	1.14	a	
11	299.92	1264.85	59	29	55	219	0.90	b	
12	338.09	1429.64	187	33	59	230	0.98		
13	351.75	1488.64	991	43	58	218	1.28		
14	462.48	1966.71	22	24	47	152	1.84	NET < CI	L
15	510.61	2174.53	179	31	58	179	1.89		
16	583.03	2487.19	378	29	44	107	1.76		
17	609.11	2599.81	736	34	43	106	1.41		
18	727.13	3109.35	66	22	41	93	1.95		
19	794.86	3401.80	53	16	30	50	1.54		
20	860.44	3684.97	79	. 15	. 26	37	1.14	•	
21	911.04	3903.41	246	24	36	73	1.47		
22	934.05	4002.77	20	18	35	70	0.36	NET < C	L
23	964.36	4133.64	74	19	36	43	2.07	a	
24	968.83	4152.93	201	22	37	50	1.63	b	
25	1120.06	4805.89	157	22	37	71	1.65		
26	1460.48	6275.68	1277	38	27	32	1.81		
27	1729.43	7436.92	36	7	9	4	1.61		
28	1763.97	7586.03	124	15	22	21	2.05		
						•			

GDR/PC	RSSI	High	${\tt Resolution}$	${\tt Gamma}$	Spectroscopy	Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

081941 PIONEER PESHTIGO SITE B-1

Sample ID:

Bkg File: . . . H:\GDR\BKG\NOCAL.BKG | Counting Start. 08-13-08 11:29 ID.: 24 Hour Background | Current Date 00-00-00 00:00

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET	NEW UN- CERTAINTY	FLAG
1	74.80	0.83	234	51	176	51	
4	92.57	1.68	139	52	89	52	NET < CL
5	185.86	1.43	314	49	285	49	
7	238.52	1.11	1059	53	1029	54	
10	295.04	1.14	549	43	525	43	
13	351.75	1.28	991	43	935	43	
15	510.61	1.89	179	31	92	32	
16	583.03	1.76	378	29	355	29	
17	609.11	1.41	736	34	642	35	
21	911.04	1.47	246	24	223	24	
24	968.83	1.63	201	22	189	23	•
25	1120.06	1.65	157	22	141	22	
26	1460.48	1.81	1277	38	1092	38	
28	1763.97	2.05	124	15	104	15	

NUCLIDE ACTIVITY SUMMARY

Sample ID: 081941 PIONEER PESHTIGO SITE B-1

Sample Size 9.44e+002 g Spectrum FileH:\MAESTROS\081941.CHN Sampling Start00-00-00 00:00 Counting Start 08-13-08 11:29 Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs Current Date00-00-00 00:00 Decay Time [OFF] 0.00e+000 Hrs
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID 500 MARINELLI ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)		aks und	
Pb-212	Average: 74,82 77.11	5.52e-007	+-2.86e-008 I.D.Only I.D.Only	1.06e+001	4 of	4	
	238.63		+-2.88e-008				
	300.09		+-2.41e-007				
Pb-214	Average:	7.92e-007	+-3.12e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98	8.01e-007	+-1.57e-007				
	295.21	7.62e-007	+-6.30e-008				
	351.92	8.02e-007	+-3.69e-008				
Ra-226	186.10		I.D.Only	1.40e+007			
Ac-228	Average:	5.98e-007	+-4.41e-008	6.13e+000	3 of	3	
	338.32	5.09e-007	+-8.90e-008				
	911.07	5.54e-007	+-5.94e-008				
	969.11	8.25e-007	+-9.82e-008				
T1-208	Average:	2.01e-007	+-1.60e-008	5.09e-002	2 of	3	
	510.84	1.82e-007	+-6.31e-008				
	583.14	2.02e-007	+-1.66e-008				1
Bi-214	Average:	7.02e-007	+-3.38e-008	3.32e-001	3 of	4	
	609.31	6.88e-007	+-3.70e-008				
	1120.30	7.61e-007	+-1.19e-007				
•	1764.50	7.79e-007	+-1.14e-007				
Bi-212	727.17	5.58e-007	+-1.84e-007	1.01e+000	1 of	4	
K-40	1460.80	1.04e-005	+-3.63e-007	1.12e+013	1 of	1	
TOTAL:		1.38e-005	uCi/g				

)

UNKNOWN PEAKS

Energy (keV)	Centroid Channel		Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
86.84	344.84	121	46	87	644	0.86	1.052e+000
209.29	873.52	192	45	86	450	1.23	1.481e+000
270.26	1136.78	90	35	67	307	1.23	8.258e-001
794.86	3401.80	53	16	30	50	1.54	1.141e+000
860.44	3684.97	79	15	26	37	1.14	1.822e+000
964.36	4133.64	74	19	36	43	2.07	1.859e+000
1729.43	7436.92	36	7	9	4	1.61	1.462e+000

GDR/PC	RSSI High Resolution Gamma Spectroscopy	
Sample ID:	081942 PIONEER PESHTIGO SITE B-2	
Sampling Start Sampling Stop	6.10e+002 g Spectrum FileH:\MAESTRO00-00-00 00:00 Counting Start 0800-00-00 00:00 Live Time	-13-08 13:03 3600 Sec
Energy(keV)=	Detector #: 1 6.97 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 07	-21-08 11:19
FWHM(keV) = 0	0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08 Where En = Sqrt(Energy in keV)	-13-07 15:28
_	0.20 Search Start / End er 1.00	0 / 8191

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
====			=======		========			
1	74.67	292.29	310	55	105	745	0.86	a
2	76.89	301.88	503	53	94	712	0.87	b
3	84.10	333.01	157	57	114	717	1.17	a
4	86.93	345.25	254	57	110	722	1.11	b
5	92.70	370.14	198	53	101	755	1.28	
6	185.75	771.90	473	52	94	572	1.65	
7	238.55	999.88	1287	60	99	498	1.19	a
8	241.58	1012.96	375	50	93	481	1.39	b
9	270.10	1136.09	157	42	81	363	2.45	
10	295.02	1243.70	796	43	65	272	1.25	
11	338.11	1429.73	227	32	56	216	1.06	
12	351.74	1488.60	1425	48	58	221	1.38	
13	462.73	1967.78	33	27	52	179	0.61	NET < CL
14	510.60	2174.46	163	31	58	179	1.57	
15	582.97	2486.95	369	28	42	104	1.47	
16	609.16	2600.02	1005	38	42	101	1.35	
17	727.05	3109.02	78	22	40	95	1.21	
18	768.33	3287.26	104	22	41	80	1.56	
19	785.62	3361.90	18	18	35	75	4.93	NET < CL
20	794.73	3401.25	51	19	36	. 76	2.82	•
21	911.02	3903.34	294	24	35	62	1.48	
22	933.87	4001.98	65	18	32	60	1.44	
23	964.39	4133.77	35	1.6	30	54	0.88	a
24	968.87	4153.11	180	21	32	56	1.51	b
25	1120.05	4805.84	214	24	40	77	1.24	
26	1237.70	5313.81	71	18	32	57	2.51	
27	1377.46	5917,25	70	12	19	16	2.07	
28	1407.53	6047.05	14	14	28	42	1.02	NET < CL
29	1460.39	6275.28	1108	37	36	58	2.00	
30	1729.29	7436.28	52	11	17	13	7.47	

•

31 1763.98 7586.08 199

16 14 2.00

GDR/PC	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
	BACKGROUND SUBTRACT RESULTS	
Sample ID :	081942 PIONEER PESHTIGO SITE B-2	
	H:\GDR\BKG\NOCAL.BKG Counting Start	

· PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET	NEW UN- CERTAINTY	FLAG
1	74.67	0.86	310	55	260	56	
3	84.10	1.17	157	57	143	57	
5	92.70	1.28	198	53	148	54	
6	185.75	1.65	473	52	444	52	
7	238.55	1.19	1287	60	1257	60	
10	295.02	1.25	796	43	761	43	
. 12	351.74	1.38	1425	48	1369	48	
14	510.60	1.57	163	31	76	31	
15	582.97	1.47	369	28	346	29	
16	609.16	1.35	1005	38	911	38	
21	911.02	1.48	294	24	271	24	
24	968.87	1.51	180	21	168	21	
25	1120.05	1.24	214	24	198	24	
29	1460.39	2.00	1108	37	923	38	
31	1763.98	2.00	199	16	179	16	

Sample ID: 081942 PIONEER PESHTIGO SITE B-2

Sample Size 6.10e+002 g Spectrum FileH:\MAESTROS\081942.CHN
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File U. CDD EFF FOOME FEE Tibrary File U. CDD TTD 1001 TTD
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID
The state of the s
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives
Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou	-	
Pb-212	74.82 77.11		I.D.Only I.D.Only	1.06e+001	3 of	4	
	238.63		+-4.99e-008				
Pb-214	Average:	1.79e-006	+-5.19e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98	1.82e-006	+-2.48e-007				
	295.21	1.71e-006	+-9.68e-008				
	351.92	1.82e-006	+-6.36e-008				
Th-228	84.37		I.D.Only	1.68e+004	1 of		
Th-234	92.80		I.D.Only		1 of		
Ra-226	186.10		I.D.Only	1.40e+007	1 of	1	
Ac-228	Average:	1.04e-006	+-6.73e-008	6.13e+000	3 of	3	
	338.32	9.58e-007	+-1.35e-007				
	911.07	1.04e-006	+-9.36e-008				
	969.11	1.13e-006	+-1.40e-007				
T1-208	Average:	3.00e-007	+-2.43e-008	5.09e-002	2 of	3	
	510.84	2.33e-007	+-9.69e-008				
	583.14		+-2.51e-008				
Bi-214	Average:	1.58e-006	+-5.65e-008	3.32e-001	4 of	4	
	609.31	1.51e-006	+-6.29e-008				
	768.36	1.91e-006	+-4.08e-007				
	1120.30	1.65e-006	+-2.03e-007				
	1764.50	2.08e-006	+-1.82e-007				
Bi-212	727.17	1.02e-006	+-2.86e-007	1.01e+000	1 of	4	
K-40	1460.80	1.36e-005	+-5.54e-007	1.12e+013	1 of	1	
TOTAL:		2.04e-005	uCi/g				

Energy (keV)	Centroid Channel		Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec	
86.93	345.25	254	57	110	722	1.11	2.215e+000	====
270.10	1136.09	157	42	81	363	2.45	1.432e+000	
794.73	3401.25	51	19	36	76	2.82	1.098e+000	
933.87	4001.98	65	18	32	60	1.44	1.593e+000	
964.39	4133.77	35	16	30	54	0.88	8.740e-001	
1237.70	5313.81	71	18	32	57	2.51	2.207e+000	
1377.46	5917.25	70	12	19	16	2,07	2.364e+000	
1729.29	7436.28	52	11	17	13	7.47	2.107e+000	

GDR/PC	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
Sample ID: 0819	43 PIONEER PESHTIGO SITE B-3	
Sampling Start Sampling Stop	7.05e+002 g Spectrum FileH:\MAESTRO 00-00-00 00:00 Counting Start 08- 00-00-00 00:00 Live Time	-13-08 14:06 3600 Sec
Energy(keV) = 6.97	Detector #: 1 ' + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 07	-21-08 11:19
	+ 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08 here En = Sqrt(Energy in keV)	-13-07 15:28
	0.20 Search Start / End	0 / 8191

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.90	293.30	316	56	106	717	0.93	
2	77.01	302.39	395	51	93	664	0.98	b
3	87.25	346.62	141	49	94	691	0.78	
4	92.58	369.64	160	53	101	755	1.30	
5	186.07	773.29	288	49	91	568	1.35	
6		1000.32	1000	56	95	473	1.13	a
7		1013.93	372	49	91	469	1.33	b
8	270.77	1138.97	64	37	71	352	1.36	NET < CL
9	295.28	1244.83	635	41	64	266	1.11	
10	327.65	1384.56	66	29	56	219	2.13	
11	338.32	1430.65	200	33	59	227	1.42	
12	351.95	1489.48	1167	46	63	246	1.33	
13	510.90	2175.77	160	31	58	171	1.96	
14	583.12	2487.61	335	30	47	130	1.32	
15	609.25	2600.43	899	35	38	80	1.75	
16	727.20	3109.66	79	19	34	67	2.63	
17	768.37	3287.43	. 89	21	40	77	2.24	
18	911.17	3903.98	250	21	29	48	1.67	
19	933.72	4001.34	51	18	33	66	2.10	
20	968.76	4152.64	174	18.	26	35	1.69	
21	1120.38	4807.26	190	20	31	49	1.45	
22	1238.09	5315.49	90	20	36	62	1.37	
23	1377.46	5917.23	23	17	35	54	0.63	NET < CL
24	1460.61	6276.26	860	31	21	20	1.91	
25	1729.30	7436.32	41	6	0	0	1.49	
26	1764.04	7586.32	148	15	19	16	2.10	

GDR/PC	Ver. 6.02a	
	BACKGROUND SUBTRACT RESULTS	
Sample ID:	081943 PIONEER PESHTIGO SITE B-3	
-	H:\GDR\BKG\NOCAL.BKG Counting Start	

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
1	74.90	0.93	316	56	248	56	
4	92.58	1.30	160	53	110	53	
5	186.07	1.35	288	49	259	49	
6	238.65	1.13	1000	56	973	56	
9	295.28	1.11	635	41	600	41	
12	351.95	1.33	1167	46	1111	47	
13	510.90	1.96	160	31	73	31	
14	583.13	1.32	335	30	312	30	
15	609.25	1.75	899	35	805	35	
18	911.17	1.67	250	21	227	21	
20	968.76	1.69	174	18	162	18	•
21	1120.38	1.45	190	20	174	20	
24	1460.61	1.91	860	31	67,5	31	,
26	1764.04	2.10	148	15	128	15	

Sample ID: 081943 PIONEER PESHTIGO SITE B-3

Sample Size 7.05e+002 g Spectrum FileH:\MAESTROS\081943.CHN
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou		
Pb-212	74.82 77.11		I.D.Only I.D.Only	1.06e+001	3 of	4	
	238.63	7.00e-007	+-4.04e-008		•		
Pb-214	Average:	1.24e-006	+-4.35e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98	1.28e-006	+-2.11e-007				
	295.21	1.17e-006	+-7.96e-008				
	351,92	1.28e-006	+-5.35e-008				
Th-234	92.80		I.D.Only	5.78e+002	1 of	3	
Ra-226	186.10		I.D.Only	1.40e+007	1 of	1	
Ac-228	Average:	7.97e-007	+-5.30e-008	6.13e+000	3 of	3	
	338.32	7.32e-007	+-1.19e-007				
	911.07	7.55e-007	+-7.10e-008				
	969.11	9.46e-007	+-1.07e-007				
T1-208	Average:	2.35e-007	+-2.18e-008	5.09e-002	2 of	3	
	510.84	1.96e-007	+-8.30e-008				
	583.14	2.38e-007	+-2.26e-008				
Bi-214	Average:	1.18e-006	+-4.55e-008	3.32e-001	4 of	4	
	609.31	1.16e-006	+-5.09e-008				
	768.36	1.41e-006	+-3.41e-007				
	1120.30	1.26e-006	+-1.47e-007				
	1764.50	1.28e-006	+-1.54e-007				
Bi-212	727.17	8.93e-007	+-2.14e-007	1.01e+000	1 of	4	
K-40	1460.80	8.59e-006	+-3.97e-007	1.12e+013	1 of	1	
TOTAL:		1.36e-005	uCi/g				

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec	
87.25	346.62	141	49	94	691	0.78	1.227e+000	
327.65	1384.56	66	29	56	219	2.13	6.934e-001	
933.72	4001.34	51	18	33	66	2.10	1.253e+000	
1238.09	5315.49	90	20	36	62	1.37	2.778e+000	
1729.30	7436.32	41	6	0	0	1.49	1.669e+000	

GDR/PC RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
Sample ID: 081944 PIONEER PESHTIGO SITE B-5	
Sample Size 8.41e+002 g Spectrum FileH:\MAESTRO Sampling Start00-00-00 00:00 Counting Start 06 Sampling Stop00-00-00 00:00 Live Time	8-13-08 16:52 . 3600 Sec . 3605 Sec
Detector #: 1 Energy(keV) = 6.97 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 0	
FWHM(keV) = 0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08 Where En = Sqrt(Energy in keV)	
Sensitivity 0.20 Search Start / End Sigma Multiplier 1.00	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	293.00	343	61	118	865	0.99	a
2	77.08	302.71	539	62	113	880	1.01	
3	87.19	346.35	118	53	102	817	0.48	
4	92.94	371.17	274	56	105	815	1.11	
5	186.10	773.40	423	54	99	683	1.57	
6	209.01	872.33	122	43	83	503	1.43	
7	238.68	1000.42	1295	57	91	471	1.06	a
8	241.88	1014.25	481	56	106	569	1.45	b
9	270.12	1136.18	116	38	72	357	1.72	
10	295.31	1244.94	840	48	79	309	1.17	a
11	300.21	1266.10	72	36	71	285	1.13	b
12	328.06	1386.33	52	36	71	295	0.73	NET < CL
13	338.37	1430.86	266	36	65	275	1.24	
14	351.96	1489.52	1568	48	55	198	1.35	
15	463.01	1969.02	138	26	46	124	1.81	
16	510.81	2175.38	191	33	60	200	1.48	
17	583.25	2488.15	419	32	49	143	1.41	
18	609.34	2600.79	1101	41	49	139	1.58	
19	727.16	3109.49	70	24	45	113	1.46	
20	768.28	3287.05	. 75	25	. 47	123	1.17	
21	860.72	3686.14	85	20	36	61	1.64	
22		3904.37	308	24	34	63	2.40	
23	933.86	4001.93	73	20	38	68	3.00	
24	968.83	4152.92	196	23	38	82	1.27	
25	1120.14	4806.24	232	25	40	81	2.26	
26	1238.39	5316.80	76	23	45	92	1.63	
27		5917.15	38	16	31	49	0.71	
28		6276.26	1242	37	25	27	1.88	
29		7435.71	45	11	19	16	2.96	
30	1764.05	7586.36	179	16	19	17	1.67	

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GDR/PC RSSI High Resolution Gamma Spectroscopy Ver. 6.02a										
====			BACKGR	OUND SUBTRAC	T RESULTS					
Sample ID: 081944 PIONEER PESHTIGO SITE B-5										
	File:	H:\GD	R\BKG\NOCA	L.BKG Coun	ting Start		08-13-08	16:52		
PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET	NEW UN- CERTAINTY	FLAG			
1	74.83	0.99	343	61	278	62				

92.94 1.11 186.10 1.57 238.68 1.06 295.31 1.17 351.96 1.35 510.81 1.48 583.25 1.41 609.34 1.58 23 25 911.26 2.40 968.83 1.27 1120.14 2.26 1460.61 1.88 1764.05 1.67

Sample ID: 081944 PIONEER PESHTIGO SITE B-5

Sample Size 8.41e+002 g Spectrum FileH:\MAESTROS\081944.CHN Sampling Start00-00-00 00:00 Counting Start 08-13-08 16:52 Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs Current Date00-00-00 00:00 Decay Time [OFF] 0.00e+000 Hrs
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID 500 MARINELLI ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou		•
Pb-212	Average:	7.65e-007	+-3.46e-008	1.06e+001	4 of	4	
	74.82		I.D.Only				
	77.11		I.D.Only				
	238.63	7.66e-007	+-3.48e-008				
	300.09	6.72e-007	+-3.35e-007				
Pb-214	Average:	1.42e-006	+-3.94e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98	1.46e-006	+-2.03e-007				
	295.21	1.32e-006	+-7.85e-008				
	351.92	1.46e-006	+-4.67e-008				
Th-234	92.80		I.D.Only	5.78e+002	1 of	3	
Ra-226	186.10		I.D.Only	1.40e+007	1 of	1	
Ac-228	Average:	8.21e-007	+-5.16e-008	6.13e+000	3 of	3	
	338.32	8.15e-007	+-1.11e-007				
	911.07	7.95e-007	+-6.78e-008				
	969.11	8.99e-007	+-1.14e-007				
T1-208	Average:	2.51e-007	+-1.97e-008	5.09e-002	2 of	3	
	510.84	2.33e-007	+-7.35e-008				
	583.14	2.52e-007	+-2.04e-008				
Bi-214	Average:	1.23e-006	+-4.41e-008	3.32e-001	4 of	4	
	609.31	1.21e-006	+-4.95e-008	•			
	768.36	9.96e-007	+-3.29e-007				
	1120.30	1.31e-006	+-1.50e-007				
	1764.50	1.33e-006	+-1.37e-007				
Bi-212	727.17	6.64e-007	+-2.26e-007	1.01e+000	1 of	4	
K-40	1460.80	1.13e-005	+-3.98e-007	1.12e+013	1 of	1	
TOTAL:		1.64e-005	uCi/g				a a decide capp

Energy (keV)	Centroid Channel		Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
87.19	346.35	118	53	102	817	0.48	1.028e+000
209.01	872.33	122	43	83	503	1.43	9.362e-001
270.12	1136.18	116	38	72	357	1.72	1.057e+000
463.01	1969.02	138	26	46	124	1.81	1.908e+000
860.72	3686.14	85	20	36	61	1.64	1.946e+000
933.86	4001.93	73	20	38	68	3.00	1.782e+000
1238.39	5316.80	76	23	45	92	1.63	2.353e+000
1377.44	5917.15	38	16	31	49	0.71	1.283e+000
1729.15	7435.71	45	11	19	16	2.96	1.839e+000

Sample ID: 081945 PIONEER PESHTIGO SITE B-6

Sample Size			7.15e+002 g	Spectrum File .	.H:\MAESTROS\081945.CHN
Sampling Start.			.00-00-00 00:00	Counting Start.	08-14-08 10:39
Sampling Stop .			.00-00-00 00:00	Live Time	3600 Sec
Current Date		٠	.00-00-00 00:00	Real Time	3605 Sec

Detector #: 1

Energy(keV) = 6.97 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 07-21-08 11:19

FWHM(keV) = $0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08-13-07 15:28$ Where En = Sqrt(Energy in keV)

PEAK SEARCH RESULTS

PK.	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
====	=======================================					======	======		
1	74.75	292.65	340	53	98	702	0.81	a	
2	77.02	302.45	580	55	98	736	0.98		
3	83.98	332.48	106	62	127	844		a NET	< CL
4	87.19	346.35	216	58	112	788	1.03		
5	93.01	371.48	295	· 57	108	800	1.70		
6	185.96	772.83	436	53	98	623	1.31		
7	238.71	1000.57	1493	58	88	446	1.05	a	
8	241.72	1013.56	460	66	133	690	1.96	b	
9	270.49	1137.77	. 74	41	81	386	0.68	NET	< CL
10	295.24	1244.62	750	46	76	285	1.20	a	
11	300.20	1266.06	66	24	43	169	0.64	b	
12	328.33	1387.52	40	32	62	261	0.49	NET	< CL
13	338.32	1430.63	281	34	60	235	0.97		
14	351.89	1489.23	1328	46	57	201	1.23		
15	463.23	1969.97	92	23	43	115	4.96		
16	510.72	2174.98	194	32	58	179	2.05		
17	583.41	2488.83	482	30	42	101	1.42		
18	609.38	2600.97	958	38	44	114	1.35		
19	665.55	2843.47	39	18	34	72	0.94		
20	727.27	3109.98	131	. 21	35 -	70	1.48		
21	768.37	3287.43	78	22	41	94	1.28		
22	795.02	3402.51	88	18	31	. 49	1.98		
23	861.04	3687.54	40	20	38	77	1.19		
24	911.30	3904.56	327	24	32	51	1.94		
25	933.84	4001.84	44	17	32	57	1.86		
26	964.60	4134.69	71	25	50	77	1.99	a	
27	969.16	4154.36	187	20	31	50	1.54	b	
28		4807.05	233	22	33	55	1.61		
29	1238.44	5316.99	51	19	36	70	0.88		
30	1377.59	5917.80	58	10	15	11	1.49		

32 33	1408.19 6049.92 1460.86 6277.32 1729.32 7436.44 1764.37 7587.75	18 984 40 170	14 34 10 17	27 28 16 24	37 36 12 25	0.75 1.76 1.93 2.63	NET < CL
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GDR/PC	RSSI Hig	n Resolution	Gamma	Spectroscopy	Ver.	6.02a
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BACKGROUND SUBTRACT RESULTS

Sample ID: 081945 PIONEER PESHTIGO SITE B-6

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
1	74.75	0.81	340	53	286	53	
3	83.98	1.31	106	62	93	63	NET < CL
5	93.01	1.70	295	57	245	57	
6	185.96	1.31	436	53	407	54	
7	238.71	1.05	1493	58	1468	58	
10	295.24	1.20	750	46	721	46	
14	351.89	1.23	1328	46	1272	46	
16	510.72	2.05	194	32	107	32	
17	583.41	1.42	482	30	459	30	
18	609.38	1.35	958	38	864	38	
24	911.30	1.94	327	24	304	24	•
27	969.16	1.54	187	20	175	21	
28	1120.33	1.61	233	22	217	22	
32	1460.86	1.76	984	34	799	34	
34	1764.37	2.63	170	17	150	17	

Sample ID: 081945 PIONEER PESHTIGO SITE B-6

Sample Size 7.15e+002 g Spectrum FileH:\MAESTROS\081945.CHN
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)		aks und	
Pb-212	Average:	1.03e-006	+-4.07e-008	1.06e+001	4 of	4	
	74.82		I.D.Only			. ,	
	77.11	4	I.D.Only				
	238.63		+-4.12e-008				
	300.09		+-2.63e-007				
Pb-214	Average:	1.43e-006	+-4.46e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98		+-2.83e-007				
	295.21		+-8.81e-008				
	351.92	1.44e-006	+-5.26e-008				
Th-234	92.80		I.D.Only		1 of	3	
Ra-226	186.10		I.D.Only		1 of	1	
Ac-228	Average:		+-5.79e-008	6.13e+000	3 of	3	
	338.32		+-1.24e-007				
	911.07		+-7.86e-008				
	969.11	1.01e-006	+-1.18e-007				
T1-208	Average:	3.40e-007	+-2.19e-008	5.09e-002	2 of	3	
	510.84	2.80e-007	+-8.40e-008		-		
	583.14	3.44e-007	+-2.27e-008				
Bi-214	Average:	1.27e-006	+-4.83e-008	3.32e-001	4 of	4	
	609.31	1.22e-006	+-5.38e-008				
	768.36	1.22e-006	+-3.45e-007				
	1120.30	1.54e-006	+-1.58e-007				
	1764.50	1.48e-006	+-1.72e-007				
Bi-212	727.17	1.47e-006	+-2.30e-007	1.01e+000	1 of	4	
K-40	1460.80	1.00e-005	+-4.30e-007	1.12e+013	1 of	1	
TOTAL:		1.66e-005	uCi/g				

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
87.19	346.35	216	58	112	788	1.03	1.875e+000
463.23	1969.97	92	23	43	115	4.96	1.283e+000
665.55	2843.47	39	18	34	72	0.94	7.263e-001
795.02	3402.51	88	18	31	49	1.98	1.895e+000
861.04	3687.54	40	20	38	77	1.19	9.194e-001
933.84	4001.84	44	17	32	57	1.86	1.089e+000
964.60	4134.69	71	25	50	77	1.99	1.779e+000
1238.44	5316.99	51	19	36	70	0.88	1.579e+000
1377.59	5917.80	58	10	15	11	1.49	1.946e+000
1729.32	7436.44	40	10	16	12	1.93	1.628e+000

299.69 1263.84 0.71 b 327.76 1385.06 0.92 337.99 1429.23 0.90 351.64 1488.14 1.29 462.52 1966.88 1.04 510.44 2173.79 1.95 582.98 2486.99 1.38 609.09 2599.73 1.48 665.30 2842.40 1.78 727.05 3109.01 . 110 1.79 768.14 3286.45 2.40 785.88 3363.03 1.52 795.09 3402.79 2.37 806.11 3450.36 2.31 860.81 3686.54 1.59 911.01 3903.31 2.22 933.49 4000.36 1.16 968.80 4152.79 1.53 29 1120.05 4805.84 1.58

1.21

1154.58 4954.91

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ÿ	31	1237.97 5314.95	206	24	41	84	1.53
•	32	1280.36 5498.01	75	16	27	37	1.96
	33	1377.36 5916.82	173	19	29	37	2.03
	34	1400.93 6018.58	60	18	34	38	1.98 a
	35	1407.43 6046.64	75	21	42	49	2.28 b
	36	1460.52 6275.86	850	34	35	56	2.18
	37	1508.83 6484.45	86	18	33	48	3.58
	38	1729.11 7435.50	79	14	24	27	1.75
	39	1764.09 7586.55	462	25	25	26	2.45
	40	1847.03 7944.65	80	11	14	9	1.64

GDR/PC	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
	BACKGROUND SUBTRACT RESULTS	
Sample ID:	081946 PIONEER PESHTIGO SITE B-8	
	.H:\GDR\BKG\NOCAL.BKG Counting Start 24 Hour Background Current Date ,	

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
2	74.42	0.99	613	73	575	73	
5	92.40	1.21	580	70	530	70	
6	185.72	1.17	814	68	785	68	
7	238.43	1.06	1640	70	1610	71	
10	294.94	1.23	2170	66	2147	66	
14	351.64	1.29	3521	71	3465	71	
16	510.44	1.95	229	35	142	35	
17	582.98	1.38	583	37	560	37	
18	609.09	1.48	2721	57	2627	57	
26	911.01	2.22	364	29	. 341	.30	
28	968.80	1.53	215	26	203	26	
29	1120.05	1.58	511	32	495	32	
36	1460.52	2.18	850	34	665	. 34	
39	1764.09	2.45	462	25	442	25	

Sample ID: 081946 PIONEER PESHTIGO SITE B-8

Sample Size 7.67e+002 g Spectrum FileH:\MAESTROS\081946.CHN
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB
ID 500 MARINELLI ID TH, U, AND K SERIES
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001]
2.00c1000 1 5.00c1001 In 0.20c 001] 02 15 00 12.00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives
Library Energy Tolerance 1.20

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Peak Foun	
Th-234	63.29 92.80		I.D.Only I.D.Only	5.78e+002	2 of	3
Pb-212	Average:	1.06e-006	+-4.61e-008	1.06e+001	3 of	4
	74.82 238.63	1.06e-006	I.D.Only +-4.66e-008			
	300.09		+-3.07e-007			
Pb-214	Average:		+-6.17e-008	4.47e-001	4 of	4
	77,11		I.D.Only			
	241.98	3.66e-006	+-2.70e-007			
	295.21	3.83e-006	+-1.17e-007			
	351.92	3.66e-006	+-7.54e-008			
Ra-226	186.10			1.40e+007		1
Ac-228	Average:	1.04e-006	+-6.83e-008	6.13e+000	3 of	3
	338.32	9.73e-007	+-1.53e-007			
	911.07		+-9.05e-008			
	969.11		+-1.42e-007			
T1-208	Average:		+-2.48 e -008		2 of	3
	510.84		+-8.66e-008			
•	583.14		+-2.59e-008			
Bi-214	Average:		+-6.66e-008		4 of	4
	609.31	*	+-7.52e-008			
	768.36		+-3.89e-007			
	1120.30		+-2.11e-007			
	1764.50		+-2.26e-007			
Bi-212	Average:		+-2.54e-007		2 of	4
	727.17		+-2.57e-007			
	785.46	THE RESERVE OF THE PERSON OF T	+-1.62e-006	and the second s		4
K-40	1460.80	7.78e-006	+-3.95e-007	1.12e+013	1 of	1

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Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
86.83	344.79	183	68	130	1332	0.62	1.595e+000
269.98	1135.58	212	57	113	672	2.00	1.937e+000
327.76	1385.06	84	41	81	399	0.92	8.871e-001
462.52	1966.88	89	32	63	228	1.04	1.234e+000
665.30	2842.40	91	25	47	130	1.78	1.697e+000
795.09	3402.79	95	20	36	68	2.37	2.036e+000
806.11	3450.36	64	20	36	76	2.31	1.394e+000
860.81	3686.54	. 50	22	43	103	1.59	1.141e+000
933.49	4000.36	87	25	48	119	1.16	2.136e+000
1154.58	4954.91	64	19	36	70	1.21	1.870e+000
1237.97	5314.95	206	24	41	84	1.53	6.364e+000
1280.36	5498.01	75	16	27	37	1.96	2.396e+000
1377.36	5916.82	173	19	29	37	2.03	5.841e+000
1400.93	6018.58	60	18	34	38	1.98	2.052e+000
1407.43	6046.64	75	21	42	49	2.28	2.591e+000
1508.83	6484.45	86	18	33	48	3.58	3.132e+000
1729.11	7435.50	79	14	24	27	1.75	3.222e+000
1847.03	7944.65	80	11	14	9	1.64	3.451e+000

PEAK SEARCH RESULTS

PK.	ENERGY	ADDRESS	NET	UN-	C.L.	BKG	FWHM	
#	(keV)	CHANNEL	COUNTS	CERTAINTY	COUNTS	COUNTS	(keV)	FLAG
1	62.33	240.65	119	59	113	1010	0.79	
2	74.09	291.49	616	70	131	1180	0.91	a
3	76.28	300.95	992	73	130	1265	0.95	b
4	83.30	331.31	113	65	128	1090	0.89	a NET < CL
5	86.38	344.63	400	69	132	1205	0.98	b
6	91.99	368.89	531	72	134	1315	1.34	
7	185.23	772.02	1025	70	123	1053	1.22	
8	208.41	872.23	167	57	110	843	1.23	
9	237.86	999.51	1750	73	124	805	1.09	a
10	241.11	1013.56	986	67	122	816	1.36	b
11	269.27	1135.31	256	50	95	555	1.64	
12	294.41	1243.94	2157	67	99	475	1.18	a
13	299.28	1264.98	91	42	84	409	1.13	b
14	337.55	1430.42	308	44	80	417	1.33	
15	351.06	1488.81	3772	72	74	354	1.39	
16	462.31	1969.52	195	32	59	186	1.40	
17	510.23	2176.58	261	36	66	228	2.03	
18	582.37	2488.23	534	38	61	212	1.17	
19	608.51	2601.13	2745	58	50	137	1.36	
20 -	664.86	2844.53	53	25	47	138	0.86	
21	726.41	3110.38	117	25	47	120	1.34	
22	767.61	3288.32	225	29	52	140	1.46	
23	785.18	3364.19	65	25	49	121	3.13	
24	794.50	3404.42	103	24	46	106	1.48	
25	805.49	3451.87	66	24	45	117	1.33	
26	838.92	3596.22	36	21	42	95	2.25	NET < CL
27	859.99	3687.19	70	21	39	89	3.53	
28	910.44	3905.00	398	30	45	109	1.88	
29	933.41	4004.16	118	25	45	109	1.08	
30	963.99	4136.20	61	24	47	93	1.45	a

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31	968.35 4155.02	217	26	44	89	1.59 k	
32	1119.67 4808.14	538	31	44	92	2.12	
33	1154.72 4959.36	73	19	35	64	1.57	
34	1237.80 5317.85	201	24	40	77	1.64	
35	1280.82 5503.48	73	20	37	65	1.94	
36	1377.42 5920.18	150	20	32	48	1.42	
37	1407.38 6049.41	67	.17	31	42	2.29	
38	1460.72 6279.49	868	34	35	52	2.39	
39	1509.08 6488.00	81	16	28	38	1.70	
40	1630.66 7012.27	15	12	24	25	0.65	NET < CL
41	1729.93 7440.24	74	17	31	41	2.19	
42	1764.86 7590.81	437	24	24	25	1.90	
43	1847.93 7948.84	29	1.4	27	33	0.72	

GDR/PC RSSI High Resolution Gamma Spectroscopy Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID: 081946A PIONEER RE-RUN B-8 4-6 767.7g

Bkg File: . . . H:\GDR\BKG\NOCAL.BKG | Counting Start. . . . 10-28-08 16:22
ID.: 24 Hour Background | Current Date 00-00-00 00:00

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
2	74.09	0.91	616	70	603	70	
6	91.99	1.34	531	72	481	72	
7	185.23	1.22	1025	70	1012	70	
9	237.86	1.09	1750	73	1734	73	
12	294.41	1.18	2157	67	2148	67	
15	351.06	1.39	3772	72	3752	72	_
17	510.23	2.03	261	36	174	36	
18	582.37	1.17	534	38	526	38	
19	608.51	1.36	2745	58	2651	58	•
28	910.44	1,88	398	30	375	30	
31	968.35	1.59	217	26	205	26	
32	1119.67	2.12	538	31	522	31	
38	1460.72	2.39	868	34	683	34	
42	1764.86	1.90	437	24	417	24	

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Sample ID: 081946A PIONEER RE-RUN B-8 4-6 767.7g

Sample Size 7.68e+002 g Spectrum File . h:\maestros\081946A.chn
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB
ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives
Library Energy Tolerance 1.20

Energy Conc +- 1.00sigma Halflife Peaks Nuclide (keV) (uCi/g) (hrs) Found	
Th-234 63.29 I.D.Only 5.78e+002 2 of 3 92.80 I.D.Only	
Pb-212 Average: 1.14e-006 +-4.81e-008 1.06e+001 3 of 4 74.82 I.D.Only	
238.63 1.14e-006 +-4.84e-008 300.09 9.27e-007 +-4.32e-007	
Pb-214 Average: 3.92e-006 +-6.19e-008 4.47e-001 4 of 4 77.11 I.D.Only	
241.98	
351.92 3.95e-006 +-7.55e-008 Ra-226 186.10 I.D.Only 1.40e+007 1 of 1	
Ac-228 Average: 1.11e-006 +-6.77e-008 6.13e+000 3 of 3 338.32 1.03e-006 +-1.46e-007 911.07 1.15e-006 +-9.13e-008 969.11 1.10e-006 +-1.39e-007	
T1-208 Average: 3.72e-007 +-2.53e-008 5.09e-002 2 of 3 510.84 4.25e-007 +-8.90e-008 583.14 3.68e-007 +-2.64e-008	
Bi-214 Average: 3.52e-006 +-6.72e-008 3.32e-001 4 of 4 609.31 3.49e-006 +-7.62e-008 768.36 3.29e-006 +-4.27e-007 1120.30 3.46e-006 +-2.08e-007	
1764.50 3.84e-006 +-2.19e-007 Bi-212 Average: 1.29e-006 +-2.60e-007 1.01e+000 2 of 4 727.17 1.22e-006 +-2.63e-007	
785.46 4.43e-006 +-1.71e-006 K-40 1460.80 7.99e-006 +-3.98e-007 1.12e+013 1 of 1	

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
86.38	344.63	400	69	132	1205	0.98	3.512e+000
208.41	872.23	167	57	110	843	1.23	1.287e+000
269.27	1135.31	256	50	95	555	1.64	2.334e+000
462.31	1969.52	195	32	59	186	1.40	2.695e+000
664.86	2844.53	53	25	47	138	0.86	9.862e-001
794.50	3404.42	103	24	46	106	1.48	2.210e+000
805.49	3451.87	66	24	45	117	1.33	1.433e+000
859.99	3687.19	70	21	39	89	3.53	1.615e+000
933.41	4004.16	118	25	45	109	1.08	2.887e+000
963.99	4136.20	61	24	47	93	1.45	1.548e+000
1154.72	4959.36	73	19	35	64	1.57	2.125e+000
1237.80	5317.85	201	24	40	77	1.64	6.230e+000
1280.82	5503.48	73	20	37	65	1.94	2,318e+000
1377.42	5920.18	150	20	32	48	1.42	5.066e+000
1407.38	6049.41	67	17	31	42	2.29	2.315e+000
1509.08	6488.00	81	16	28	38	1.70	2.936e+000
1729.94	7440.24	74	17	31	41	2.19	3.020e+000
1847.93	7948.84	29	14	27	33	0.72	1.232e+000

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GDR/PC RSSI High Resolution Gamma Spectroscopy Ver. 6.02a
Sample ID: 081947 PIONEER PESHTIGO SITE B-9
Sample Size 6.88e+002 g Spectrum FileH:\MAESTROS\081947.CHI Sampling Start00-00-00 00:00 Counting Start 08-14-08 12:4 Sampling Stop00-00-00 00:00 Live Time
Detector #: 1 Energy(keV)= 6.97 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 07-21-08 11:1
FWHM(keV) = $0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08-13-07 15:2$ Where En = Sqrt(Energy in keV)
Sensitivity 0.20 Search Start / End 0 / 819 Sigma Multiplier 1.00

PEAK SEARCH RESULTS

PK.	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV) F	LAG
1	74.50	291.57	380	55	103	753	0.86 a	
2	76.79	301,47	539	57	102	765	1.00 b	
3	86.84	344.86	267	56	106	823	1.41	
4	92.54	369.48	358	55	101	748	1.94	
5	185.92	772.62	425	52	94	616	1.29	
6	209.04	872.46	103	41	78	485	0.79	
7	238.42	999.32	1654	65	105	547	1.19 a	
. 8	241.52	1012.70	503	53	99	538	1.34 b	
9	270.41	1137.44	102	41	80	390	1.52	
10	294.95	1243.38	911	47	74	276	1.19 a	
11	299.82	1264.42	120	41	82	318	1.33 b	
12	338.09	1429.63	266	33	57	221	0.91	
13	351.67	1488.30	1483	50	63	246	1.26	
14	409.07	1736.13	80	28	54	168	1.43	
15	462.48	1966.69	94	25	47	138	0.88	
16	510.60	2174.47	261	31	54	160	1.49	
17	582.98	2486.98	538	32	45	117	1.29	
18	609.12	2599.85	1121	42	51	149	1.39	
19	726.99	3108.78	110	21	36	76	1.14	
.20	767.98	3285.74	105	22	40	82	1.48	
21	785.42	3361.02	56	16	29	48	1.07	
22	794.72	3401.18	50	19	36	81	1.45	
23	860.18	3683.82	57	18	35	63	0.96	
24	910.97	3903.10	290	26	41	88	1.67	
25	933.88	4002.02	73	16	28	43	2.73	
26	964.06	4132.35	60	20	40	62	1.63 a	
27	968.75	4152.60	239	25	42	69	1.75 b	
28	1120.02	4805.70	234	23	35	62	1.40	
29		5314.76	113	16	24	30	2.32	
30	1377.39	5916.96	67	15	25	31	1.69	

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	1407.38		31	13	24	27	2.33
32	1460.55	6276.01	746	31	28	38	2.21
33	1508.86	6484.58	25	12	22	25	0.92
34	1587.51	6824.15	33	13	25	31	1.09
35	1729.29	7436.30	57	9	10	4	2.12
36	1764.22	7587.12	224	1.8	20	17	1 92

GDR/	GDR/PC RSSI High Resolution Gamma Spectroscopy							
			•	OUND SUBTRAC			:=====================================	
Samp	le ID :	08194	7 PIONEER	PESHTIGO SIT	PE B-9			
				L.BKG Cour				
PK#	(keV)	(keV)	COUNTS	OLD UN- CERTAINTY	COUNTS	CERTAINTY		
1	74.50	0.86	380	55	341	56		
4	92.54			55		55 52	•	
5 7	238.42		1654	52 65		52 65		
10	294.95		911	47	889	47		
13	351.67		1483		1427	50		
16	510.60		261		174	31		
17	582.98		538	32	515	32		
18	609.12	1.39	1121	42	1027	42		
24	910.97		290	26	267	26		
27	968.75	1.75	239	25	227	25	•	
28	1120.02	1.40	234	23		23		
32	1460.55		746	31		31		
36	1764.22	1.92	224	18	204	18		

Sample ID: 081947 PIONEER PESHTIGO SITE B-9

Sample Size 6.88e+002 g Spectrum FileH:\MAESTROS\081947.CHN
Sampling Start
Sampling Stop00-00-00 00:00 Buildup Time 0.00e+000 Hrs
Current Date
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB
ID 500 MARINELLI ID TH, U, AND K SERIES
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
EII.= 1/[2.90e-002/EII -2.05e+000 + 9.55e+001/EII 6.20e-001]
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives
Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou		
Pb-212	Average: 74.82 77.11	1.20e-006	+-4.79e-008 I.D.Only	1.06e+001	4 of	4	
	238.63	1 200-006	I.D.Only +-4.81e-008	•	•		
	300.09		+-4.65e-007				
Pb-214	Average:		+-4.87e-008	4.47e-001	4 of	4	
	77.11	20.00	I.D.Only	11110 001		•	
	241.98	1.68e-006	+-2.37e-007				
	295.21	1.77e-006	+-9.36e-008				
	351.92	1.68e-006	+-5.87e-008				
Th-234	92.80		I.D.Only	5.78e+002	1 of	3	
Ra-226	186.10		I.D.Only	1.40e+007	1 of	1	
Ra-224	240.98	1.04e-006	+-4.49e-007	8.69e+001	1 of	1	
Ac-228	Average:	1.02e-006	+-6.54e-008	6.13e+000	3 of	3	
	338.32	9.94e-007	+-1.23e-007				
	911.07	9.10e-007	+-8.96e-008				
	969.11		+-1.52e-007				
T1-208	Average:		+-2.41e-008	5.09e-002	2 of	3	
	510.84		+-8.55e-008				
	583.14		+-2.51e-008				
Bi-214	Average:		+-5.46e-008	3.32e-001	4 of	4	
	609.31		+-6.16e-008				
	768.36		+-3.58e-007				
•	1120.30		+-1.70e-007				
	1764.50		+-1.83e-007	4 04 .055		_	
Bi-212	Average:		+-2.36e-007	1.01e+000	2 of	4	
	727.17	the same and the same and the same and the same	+-2.41e-007				***********
	785.46	4.29e-006	+-1.22e-006				

K-40

1460.80

7.31e-006 +-4.00e-007 1.12e+013 1 of 1

TOTAL:

1.57e-005 uCi/g

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
86.84	344.86	267	<u></u> 56	106	823	1.41	2.327e+000
209.04	872.46	103	41	78	485	0.79	7.911e-001
270.41	1137.44	102	41	80	390	1.52	9.328e-001
409.07	1736.13	80	- 28	54	168	1.43	1.007e+000
462.48	1966.69	94	25	47	138	0.88	1.303e+000
794.72	3401.18	50	19	36	81	1.45	1.076e+000
860.18	3683.82	57	18	35	63	0.96	1.309e+000
933.88	4002.02	73	16	28	43	2.73	1.785e+000
964.06	4132.35	60	20	40	62	1.63	1.510e+000
1237.92	5314.76	113	16	24	30	2.32	3.496e+000
1377.39	5916.96	67	15	25	31	1.69	2.274e+000
1407.38	6046.43	31	13	24	27	2.33	1.071e+000
1508.86	6484.58	25	12	22	25	0.92	8.917e-001
1587.51	6824.15	33	13	25	31	1.09	1.265e+000
1729.29	7436.30	57	9 .	10	4	2.12	2.305e+000

GDR/PC R	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
Sample ID: 08194	8 PIONEER PESHTIGO SITE B-10	
Sampling Start Sampling Stop	7.00e+002 g Spectrum FileH:\MAESTR00-00-00 00:00 Counting Start	08-14-08 14:59 . 3600 Sec
Energy(keV) = 6.97	Detector #: 1 + 0.232*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 0	07-21-08 11:19
	+ 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 Cere En = Sqrt(Energy in keV)	08-13-07 15:28
_	0.20 Search Start / End	. 0 / 8191

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.50	291.58	347	61	117	825	0.93	a
2	76.81	301.56	564	52	90	659	0.87	b
3	83.97	332.45	100	45	85	566	0.77	a
4	86.98	345.45	192	58	115	811	1.03	b
5	92.60	369.71	284	57	108	811	1.97	
6	185.86	772.36	469	51	92	579	1.74	
7	209.07	872.58	179	50	98	591	1.34	
8	238.48	999.55	1680	62	96	486	1.17	a
9	241.58	1012.97	495	55	104	552	1.41	b
10	270.40	1137.38	102	40	78	375	1.15	
11	295.06	1243.84	849	45	70	265	1.13	a
12	299.68	1263.81	73	29	55	225	0.82	b
13	327.62	1384.44	82	32	61	238	1.00	
14	338.13	1429.80	326	37	64	255	0.97	
15	351.73	1488.53	1423	47	55	198	1.35	
16	462.64	1967.39	86	26	48	150	1.23	
17	510.54	2174.23	234	29	50	156	1.63	
18	582,98	2486.98	524	30	40	90	1.64	
19	609.07	2599.64	1066	38	40	95	1.81	
20	727.36	3110.38	147	23	39	77	2.56	
21	767.99	3285.79	115	22	40	73	1.95	
22	785.88	3363.01	41	20	38	76	1.49	
23	794.98	3402.31	57	20	37	70	1.14	
24	860.14	3683.63	30	20	38	90	0,82	NET < CL
25	910.95	3903.01	347	25	35	63	1.68	
26	933.95	4002.32	42	16	29	51	2.85	
27	964.74	4135.28	60	21	42	61	2.23	a
28	968.70	4152.36	207	22	34	51	1.40	b
29	1120.02	4805.71	254	20	26	33	2.01	
30	1238.05	5315.32	79	17	31	48	4.49	

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31	1377.25 5916.33	70	13	21	20 1.66	:
	1460.40 6275.33	745	30	25	28 2.16	
-	1630.85 7011.29	24	10	17	11 2.00	
	1729.34 7436.50	35	11			
	1764 00 7586 16	177	16	20	19 1.47	

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GDR/PC	RSSI	High	${\tt Resolution}$	Gamma	Spectroscopy	Ver. 6	.02a

BACKGROUND SUBTRACT RESULTS

Sample ID: 081948 PIONEER PESHTIGO SITE B-10

Bkg File: . . . H:\GDR\BKG\NOCAL.BKG | Counting Start. 08-14-08 14:59 ID.: 24 Hour Background | Current Date 00-00-00 00:00

	ENERGY	FWHM	OLD NET	OLD UN-	NEW NET	NEW UN-	
PK#	(keV)	(keV)	COUNTS	CERTAINTY	COUNTS	CERTAINTY	FLAG
1	74.50	0.93	347	61	306	61	
3	83.97	0.77	100	45	93	45	
5	92.60	1.97	284	57	234	57	
6	185.86	1.74	469	51	440	51	
8	238.48	1.17	1680	62	1648	62	
11	295.06	1.13	849	45	825	45	
15	351.73	1.35	1423	47	1367	47	
17	510.54	1.63	234	29	147	30	
18	582.98	1.64	524	30	501	30	
19	609.07	1.81	1066	38	972	38	
25	910.95	1.68	347	25	324	25	
28	968.70	1.40	207	22	195	22	
29	1120.02	2.01	254	20	238	20	
32	1460.40	2.16	745	30	560	30	
35	1764.00	1.80	177	16	157	16	

Sample ID: 081948 PIONEER PESHTIGO SITE B-10

Sample Size
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID 500 MARINELLI ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)		eaks ound	
Pb-212	Average:	1.19e-006	+-4.47e-008	1.06e+001	4 of	4	
	74.82		I.D.Only				
-	77.11		I.D.Only				
	238.63		+-4.51e-008				
	300.09		+-3.25e-007				
Pb-214	Average:	1.59e-006	+-4.54e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98	1.58e-006	+-2.40e-007				
	295.21	1.61e-006	+-8.81e-008				
	351.92	1.58e-006	+-5.43e-008				
Th-228	84.37		I.D.Only	1.68e+004	1 of		
Th-234	92.80		<pre>I.D.Only</pre>	5.78e+002	1 of	3	
Ra-226	186.10		I.D.Only	1.40e+007	1 of		
Ra-224	240.98	1.09e-006	+-4.55e-007	8.69e+001	1 of	1	
Ac-228	Average:	1.13e-006	+-6.26e-008	6.13e+000	3 of	3	
	338.32	1.20e-006	+-1.35e-007				
	911.07	1.09e-006	+-8.48e-008				
	969.11	1.15e-006	+-1.28e-007				•
T1-208	Average:	3.85e-007	+-2,23e-008	5.09e-002	2 of	3	
	510.84	3.95e-007	+-7.97e-008				
	583.14	3.84e-007	+-2.33e-008				
Bi-214	Average:	1.47e-006	+-4.90e-008	3.32e-001	4 of	4	
	609.31	1.40e-006	+-5.55e-008				
	768.36	1.85e-006	+-3.50e-007				
	1120.30	1.73e-006	+-1.48e-007				
	1764.50	1.58e-006	+-1.62e-007				
Bi-212	Average:	1.72e-006	+-2.54e-007	1.01e+000	2 of	4	
	727.17	1.68e-006	+-2.58e-007				

785.46

3.05e-006 +-1.47e-006

K-40 14

1460.80

7.18e-006 +-3.84e-007 1.12e+013

l of

TOTAL:

1.57e-005 uCi/g

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
86.98	345.45	192		115	811	1.03	1.674e+000
209.07	872.58	179	50	98	591	1.34	1.379e+000
270.40	1137.38	102	40	78	375	1.15	9.328e-001
327.62	1384.44	82	32	61	238	1.00	8.657e-001
462.64	1967.39	86	26	48	150	1.23	1.190e+000
794.98	3402.31	57	20	37	. 70	1.14	1.235e+000
933.95	4002.32	42	16	29	51	2.85	1.032e+000
964.74	4135.28	60	21	42	61	2.23	1.525e+000
1238.05	5315.32	79	17	31	48	4.49	2.448e+000
1377.25	5916.33	70	13	21	20	1.66	2.354e+000
1630.85	7011.29	24	10	17	11	2.00	9.176e-001
1729.34	7436.50	35	11	20	19	1.47	1.424e+000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	74.32	290.81	211		==== ================================		0.83	a	
2	76.66		443	55	100	762	0.98		
3	86.81	344.73	200	49	91	658	0.97		
4	92.38		254		97	698	1.51		
5		770.77	543	51	91	513	1.88		
6	208.88		86	42	81	488	0.95		
7	238.29	998.73	1127	55	90	442	1.10	a	
8	241.33	1011.86	370	50	95	483	1.32	b	
9	270.05	1135.87	102	36	70	317	2.14		
10	294.82	1242,81	718	46	78	279	1.30	a	
11	299.80	1264.35	68	27	50	182	0.83	b	
12	337.97	1429.14	265	33	56	207	1.45		
13	351.53	1487.68	1270	45	56	192	1.24		
14	462.54	1966.99	72	23	43	114	2.04		
15	510.56	2174.31	206	29	51	152	1.55		
16	582.84	2486.40	404	28	40	87	1.58		
17	608.93	2599.04	954	37	40	95	1.45		
18	726.80	3107.95	67	21	39	89	1.30		
19	768.35	3287.32	68	21	40	90	1.40		
20	795.02	3402.48	. 45	19	36	67	1.24		
21	860.15	3683.70	36	17	31	60	1.38		
22	910.77	3902.28	257	24	36	67	1.37		
23	933,42	4000.05	48	16	29	48	1.60		
24	964.24	4133.14	53	20	39	57	1.57	a	
25	968.61	4151.97	165	23	40	64	1.88	b	
26	1119.84	4804.92	170	21	33	54	2.10		
27	1237.87	5314.53	66	19	35	62	2.32		
28	1377.45	5917.19	54	11	17	15	2.73		
29	1460.18	6274.39	862	31	21	20	2.10		
30	1729.13	7435.61	37	9	14	9	2.21		

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31 1763.97 7586.05

139

15

20

17 1.65

GDR/PC	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
	BACKGROUND SUBTRACT RESULTS	
Sample ID:	081949 PIONEET PESHTIGO SITE B-11	======================================
_	.H:\GDR\BKG\NOCAL.BKG Counting Start 24 Hour Background Current Date	

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
1	74.32	0.83	======================================	51		51	
4	92.38	1.51	254	52	204	52	
5	185.49	1.88	543	51	514	51	
7	238.29	1.10	1127	55	1100	56	
10	294.82	1.30	718	46	697	46	
13	351.53	1.24	1270	45	1214	45	
15	510.56	1.55	206	29	119	29	
16	582.84	1.58	404	28	381	28	
17	608.93	1.45	954	37	860	37	
22	910.77	1.37	257	24	234	24	
25	968.61	1.88	165	23	153	23	
26	1119.84	2.10	170	21	154	21	
29	1460.18	2.10	862	31	677	31	
31	1763.97	1.65	139	15	119	15	

NUCLIDE ACTIVITY SUMMARY

Sample ID: 081949 PIONEET PESHTIGO SITE B-11

Sample Size
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID 500 MARINELLI ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou		
Pb-212	Average:	7.44e-007	+-3.72e-008	1.06e+001	4 of	4	
	74.82		I.D.Only				
•	77.11		I.D.Only				
	238.63	7.45e-007	+-3.76e-008				
	300.09	7.09e-007	+-2.79e-007				
Pb-214	Average:	1.30e-006	+-4.15e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98		+-2.04e-007				
	295.21		+-8.42e-008				
	351.92	1.31e-006	+-4.90e-008				
Th-234	92.80		<pre>I.D.Only</pre>		1 of	3	
Ra-226	186.10		I.D.Only		1 of	1	
Ac-228	Average:		+-5.56e-008	6.13e+000	3 of	3	
	338.32		+-1.12e-007				
	911.07		+-7.43e-008				
	969.11		+-1.27e-007				
T1-208	Average:		+-1.94e-008	5.09e-002	2 of	3	
	510.84		+-7.37e-008		•		
	583.14		+-2.01e-008				
Bi-214	Average:		+-4.42e-008	3.32e-001	4 of	4	
	609.31		+-4.98e-008				
	768.36		+-3.21e-007				
	1120.30		+-1.41e-007				
	1764.50		+-1.44e-007				
Bi-212	727.17		+-2.24e-007		1 of	4	
K-40	1460.80	8.11e-006	+-3.74e-007	1.12e+013	1 of	1	
TOTAL:		1.31e-005	uCi/g				

UNKNOWN PEAKS

Energy	Centroid	Net	Un-	C.L.	Bkg.	FWHM	Net
(keV)	Channel	Counts	Certainty	Counts	Counts	(keV)	Gamma/sec
86.81	344.73	200	49	91	658	0.97	1.747e+000
208.88	871.76	86	42	81	488	0.95	6.586e-001
270.05	1135.87	102	36	70	317	2.14	9.288e-001
462.54	1966.99	72	23	43	114	2.04	9.982e-001
795.02	3402.48	45	19	36	67	1.24	9.582e-001
860.15	3683.71	36	17	31	60	1.38	8.268e-001
933.42	4000.04	48	16	29	48	$\frac{1.60}{1.57}$	1.166e+000
964.24	4133.14	53	20	39	57		1.329e+000
1237.87	5314.54	66	19	35	62	2.32	2.032e+000
1377.45	5917.19	54	11	17	· 15		1.835e+000
1729.13	7435.61	37	9	14	9	2.73	1.519e+000

363

69 132

21 20

1.12

1.34

1.71

1.97

1.35

1.57

1.05

0.82

4.58

1.74

1.39

1.21

1.74

1.97

2.52

1.60 a

1.58 b

NET < CL

327.80 1385.24

338.12 1429.79

351.81 1488.90

462.69 1967.63

510.74 2175.09

583.03 2487.21

609.19 2600.16

727.14 3109.43

768.33 3287.26

794.30 3399.40

911.05 3903.48

933.73 4001.39

964.38 4133.73

968.83 4152.92

27 1119.96 4805.44

28 1237.94 5314.85

29 1376.89 5914.77 30 1460.34 6275.10
 31
 1729.27
 7436.19
 44
 9
 14
 8
 5.64

 32
 1763.97
 7586.03
 180
 18
 27
 30
 1.97

 33
 1846.76
 7943.48
 16
 8
 15
 11
 0.81

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GDR/PC RSSI High Resolution Gamma Spectroscopy Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID: 081950 PIONEER PESHTIGO SITE B-12

Bkg File: . . . H:\GDR\BKG\NOCAL.BKG | Counting Start. 08-12-08 17:41 ID.: 24 Hour Background | Current Date 00-00-00 00:00

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
2	74.81	1.15	382	61	313	61	
5	92.67	1.64	310	51 :	260	51	
6	186.01	1.32	480	50	451	51	
7	238.53	1.17	1261	58	1230	58	
11	295.10	1.30	833	46	806	46	
15	351.81	1.34	1364	46	1308	46	
17	510.74	1.97	214	. 28	127	28	
18	583.03	1.35	363	29	340	29	
19	609.19	1.57	1017	38	923	38	
23	911.05	1.74	278	23	255	24	
26	968.83	1.58	132	19	120	20	•
27	1119.96	1.21	209	24	193	24	
30	1460.34	2.52	796	31	611	31	
32	1763.97	1.97	180	18	1.60	19	

NUCLIDE ACTIVITY SUMMARY

Sample ID: 081950 PIONEER PESHTIGO SITE B-12

Sample Size
Efficiency File.H:\GDR\EFF\500MAR.EFF Library File H:\GDR\LIB\1001.LIB ID 500 MARINELLI ID
Eff.= 1/[2.90e-002*En^-2.65e+000 + 9.35e+001*En^8.20e-001] 02-19-08 12:00
Gamma Fraction Limit >= 10.00 % Decay Limit <= 8.000 Halflives Library Energy Tolerance 1.20

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- (uCi/g	1.00sigma)	Halflife (hrs)	Pea Fou		
Pb-212	Average:	8.87e-007	+-4.17e-008	1.06e+001	4 of	4	
	74.82		I.D.Only				
	77.11		I.D.Only				
	238.63		+-4.19e-008				
	300.09		+-4.18e-007				
Pb-214	Average:	1.52e-006	+-4.46e-008	4.47e-001	4 of	4	
	77.11		I.D.Only				
	241.98		+-2.28e-007				
	295.21		+-8.91e-008				
	351.92	1.51e-006	+-5.29e-008				
Th-234	92.80		I.D.Only	5.78e+002	1 of	3	
Ra-226	186.10		I.D.Only	1.40e+007	1 of	1	
Ra-224	240.98	9.70e-007	+-4.32e-007	8.69e+001	1 of	1	
T1-208	Average:	2.67e-007	+-2.12e-008	5.09e-002	3 of	3	
	277.35	4.10e-007	+-1.85e-007				
	510.84	3.39e-007	+-7.54e-008				
	583.14	2.59e-007	+-2.22e-008				
Ac-228	Average:	8.39e-007	+-5.66e-008	6.13e+000	3 of	3	
	338.32	9:55e-007	+-1.15e-007				
	911.07	8.50e-007	+-7.88e-008				
	969.11	6.99e-007	+-1.15e-007				
Bi-214	Average:	1.35e-006	+-5.04e-008	3.32e-001	3 of	4	
	609.31	1.33e-006	+-5.49e-008				
	1120.30	1.40e-006	+-1.75e-007				
	1764.50	1.60e-006	+-1.86e-007				
Bi-212	727.17	8.73e-007	+-2.35e-007	1.01e+000	1 of	4	
K-40	1460.80	7.78e-006	+-3.96e-007	1.12e+013	1 of	1	

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UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un- Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec	_
269.82	1134.89	100	42	83	377	1.55	9.161e-001	•
327.80	1385.24	65	33	64	252	1.79	6.865e-001	
462.69	1967.63	58	22	42	113	1.71	7.997e-001	
794.30	3399.40	72	18	33	56	4.58	1.549e+000	
933.73	4001.39	51	15	28	42	1.39	1.253e+000	
964.38	4133.73	69	21	42	61	1.60	1.739e+000	
1237.94	5314.85	106	17	27	39	1.74	3.265e+000	
1376.89	5914.77	65	13	21	20	1.97	2.195e+000	
1729.27	7436.19	44	9	14	8	5.64	1.786e+000	
1846.76	7943.48	16	8	15	11	0.81	7.079e-001	

GDR/PC RSSI High Resolution Gamma Spectroscopy Ver. 6.02a
Sample ID: 082400 PIONEER B-13 2-4 539.5
Sample Size 5.40e+002 g Spectrum FileH:\maestros\082400.ch Sampling Start00-00-00 00:00 Counting Start 10-16-08 11:1 Sampling Stop00-00-00 00:00 Live Time
Detector #: 1 Energy(keV)= 7.26 + 0.231*Ch + 3.28e-008*Ch^2 + 0.00e+000*Ch^3 10-16-08 10:3
FWHM(keV) = 0.94 + 0.015*En + 2.91e-004*En^2 + 0.00e+000*En^3 08-13-07 15:2 Where En = Sqrt(Energy in keV)
Sensitivity 0.20 Search Start / End 0 / 819 Sigma Multiplier 1.00

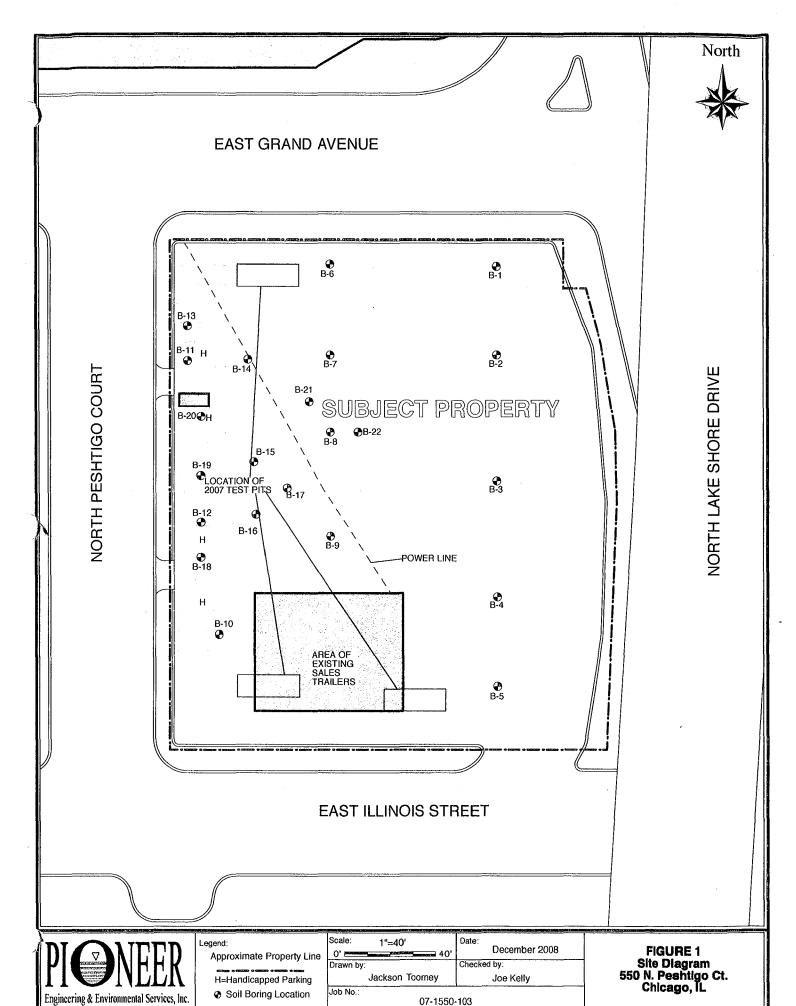
PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.85	292.38	294	51	96	594	0.94	a.
2	77.09	302.09	319	43	76	490	0.83	b ·
3	87.19	345.77	106	39	72	478	1.09	
4	92.79	370.00	209	46	86	548	1.09	,
5	185.75	772.04	314	43	78	421	1.14	
6	209.02	872.70	168	41	79	387	1.33	
7	238.59	1000.59	1034	56	94	448	1.21	a
8	241.76	1014.28	291	45	84	413	1.25	b
9	270.48	1138.48	64	36	71	291	1.30	NET < CL
10	295.09	1244.92	596	40	66	223	1.18	a
11	300.14	1266.73	37	22	41	142	0.64	b NET < CL
12		1430.80	208	32	57	198	1.41	
13	351.81	1490.17	1061	43	55	189	1.31	
14	462.70	1969.61	73	21	38	89	1.44	
15	510.87	2177.88	190	28	51	137	3.58	
16	583.11	2490.15	331	26	39	89	1.55	
17	609.10	2602.50	705	35	45	120	1.35	
18	727.34	3113.60	84	20	36	70	1.89	
19	768.39	3290.98	52	19	36	81	1.19	
20	794.52	3403.94	. 35	15	. 29	51	1.23	
21	911.08	3907.63	266	21	27	36	1.96	
22	964.64	4139.06	52	22	44	71	2.04	a
23	968.80	4157.01	100	20	35	61	1.23	b
24	1120.14	4810.85	174	19	28	39	1.56	
25	1237.95	5319.74	79	16	27	39	1.86	
26	1460.88	6282.49	714	30	27	33	2.29	
27	1729.89	7443.92	28	9	16	12	1.10	
28	1764.82	7594.70	141	13	9	4	2.21	

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GDR/PC	RSSI High Resolution Gamma Spectroscopy	Ver. 6.02a
	BACKGROUND SUBTRACT RESULTS	
Sample ID:	082400 PIONEER B-13 2-4 539.5	

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	NEW NET COUNTS	NEW UN- CERTAINTY	FLAG
1	74.85	0.94	294	51	229		
4	92.79	1.09	209	46	159	47	
5	185.75	1.14	314	43	285	44	•
7	238.59	1.21	1034	56	1004	56	
10	295.09	1.18	596	40	570	40	
13	351.81	1.31	1061	43	1005	43	
15	510.87	3,58	190	28	103	29	
16	583.11	1.55	331	26	308	27	
17	609.10	1.35	705	35	611	35	
21	911.08	1.96	266	21	243	21	
23	968.80	1.23	100	20	88	20	
24	1120.14	1.56	174	19	158	19	
26	1460.88	2.29	714	30	529	30	
28	1764.82	2.21	141	13	121	13	



AECOM - Down-hole Gamma Results - June 29, 2011

Down-hole Gamma Results June 29, 2011 515 North Peshtigo Court

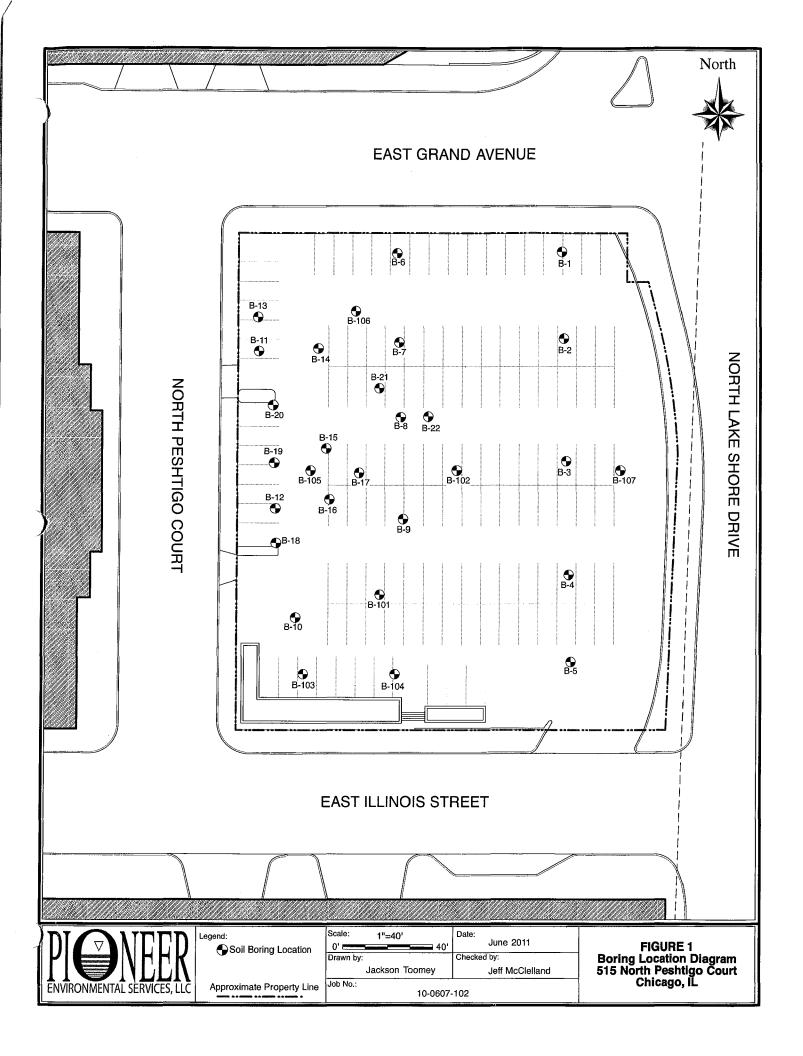
B-101	B-102	B-103	B-104	B-105	B-106	B-107
DTB: 10.53	DTB: 10.05	DTB: 11.52	DTB: 11.46	DTB: 11.51	DTB: 11.53	DTB: 10.11
220	273	269	222	247	279	323
460		224	198	267	295	
	689					472
1513		777	857	1148	1528	
	1569					1211
1152		921	1552	2970	1891	
	2086					1498
1150		1893	2313	1499	1569	
	2616					1423
1251		1435	2642	1664	1381	
	1660					1140
1177		894	1675	1778	1214	
	1306			:		1196
2954		1099	1460	920	1158	
	1155					1135
1677		1309	1397	824	845	
	1172					868
1213		827	911	1210	583	
	877					880
1069		896	726	997	505	
	629					561
935		1109	911	754	452	
						·
		880	1006	561	533	
	DTB: 10.53 220 460 1513 1152 1150 1251 1177 2954 1677 1213 1069	DTB: 10.53 DTB: 10.05 220 273 460 689 1513 1569 1152 2086 1150 2616 1251 1660 1177 1306 2954 1155 1677 1172 1213 877 1069 629	DTB: 10.53 DTB: 10.05 DTB: 11.52 220 273 269 460 224 689	DTB: 10.53 DTB: 10.05 DTB: 11.52 DTB: 11.46 220 273 269 222 460 224 198 689 777 857 1513 777 857 1152 921 1552 2086 1893 2313 2616 1435 2642 1177 894 1675 1306 1099 1460 1155 1309 1397 1172 1309 1397 1172 827 911 877 896 726 629 935 1109 911	DTB: 10.53 DTB: 10.05 DTB: 11.52 DTB: 11.46 DTB: 11.51 220 273 269 222 247 460 224 198 267 689	DTB: 10.53 DTB: 10.05 DTB: 11.52 DTB: 11.46 DTB: 11.51 DTB: 11.53 220 273 269 222 247 279 460 224 198 267 295 689

Notes: Conducted with a 1/2 by 1-inch NaI probe with a 1-inch lead end cap.

Site down-hole background estimated at 1,200 cpm.

Value equivalent to the USEPA threshold of 7.1 pCi/g is approximately 3,491 cpm.

= Values greater than twice background.



STS Subsurface Gamma Survey Results - July 28, 2011

AECOM Environment

303 East Wacker Drive, Suite 900, Chicago, IL 60601 T 312.373.7700 F 312.938.1109 www.aecom.com



July 28, 2011

Related Midwest 350 West Hubbard Street, Suite 300 Chicago, IL 60654

Attn: Mr. Donald M. Biernacki

RE: Radiological Survey of Subsurface Environmental Investigation

Permit Address: 515 North Peshtigo Court

AECOM Project No. 60219374

Dear Mr. Biernacki:

Pursuant to conditions specified in the Work Plan, radiation monitoring was required to be performed at the above referenced site. AECOM, Inc. (AECOM) provided the required radiation surveillance, on the days of June 29, 2011 and July 27, 2011, for the drilling of seven (7) soil borings (B-101 through B-107) and three (3) monitoring wells (B-108 through B-110). On June 29, 2011, seven soil borings were advanced with a Geoprobe drill rig to depths of approximately 12-feet bgs (below ground surface). Borings were advanced in order to collect soil samples for laboratory analysis as well as to collect down-hole radiological measurements. Down-hole radiological readings were collected by the process of 1-minute count average measurements at every 1-foot depth interval at each of the 7 borings. The monitoring revealed no indication of soils above the specified clean-up threshold established by the U.S. Environmental Protection Agency (USEPA) for the Streeterville area of Chicago. The USEPA threshold for Chicago's Streeterville area is 7.1 picocuries per gram (pCi/g total radium (Ra-226 + Ra-228). Gamma radiation count measurements for the project were made using Ludlum Model 2221 survey meter and an unshielded 1/2 x 1 inch Nal probe (Model 44-10) with 1-inch lead cap. The probe was equipped with a 1-inch thick lead end cap at the lower end of the probe to maximize the lateral sensitivity of the probe and minimize the influence of deeper material on the gamma readings. AECOM personnel were responsible for the survey results collected during all drilling activities. For the instrument used, the gamma count indicative of the 7.1 pCi/g threshold was 3,491 counts per minute (cpm) shielded. The end cap shielded field gamma measurements within the spoil materials generated during the entire drilling process did not exceed the respective threshold values previously stated and ranged between 222-2,970 cpm (refer to attached Table). Thus, there was no indication of the presence of radiologically-impacted material and/or an exceedance of the USEPA cleanup threshold of 7.1 pCi/g total radium. Though it should be noted that AECOM believes that that a conservative approach is warranted for down-hole screening activities because the volume of material being screened is small compared to surface and/or lift screening activities that generally screen 100% of the exposed surface. Generally, because of the shielding effects of soil, the Nal probe surveys only about a 1½ foot radius around the borehole.

On July 27, 2011, three monitoring wells were installed to depths ranging from 15-feet to 25-feet. Screening was performed on all soils characterized as urban fill that were displaced to the surface during the process of drilling at each of the three monitoring well locations. Due to the presence of groundwater present within each well, no down-hole radiological measurements were performed at any of the three monitoring wells. All three monitoring wells were installed using a 4.25-inch diameter hollow stem auger. Urban fill thicknesses encountered during the drilling investigation were observed to approximate depths of 12-feet bgs. Drilling spoils were screened at 2.5-foot intervals as the auger was advanced to the bottom of the final borehole elevation. Also, 2.5-foot split-spoons were used during drilling activities to collect soil samples for laboratory analysis. Each split-spoon was screened for the potential presence of radiologically-impacted material before clearance was given to sample. The monitoring revealed no indication of soils above the specified clean-up threshold established by the U.S. Environmental Protection Agency (USEPA) for the Streeterville area of Chicago. The USEPA threshold for Chicago's Streeterville area is 7.1 picocuries per gram (pCi/g total radium (Ra-226 + Ra-228). Gamma radiation count measurements for the project were made using Ludlum Model 2221 survey meter and an unshielded 2 x 2 inch Nal probe (Model 44-10). AECOM personnel were responsible for the survey results collected during all drilling activities. For the instrument used, the

515 North Peshtigo Court Page 2

gamma count indicative of the 7.1 pCi/g threshold was 18,617 counts per minute (cpm) unshielded. The unshielded field gamma measurements within the spoil materials generated during the entire drilling process did not exceed the respective threshold values previously stated and ranged near background levels between 4,200-6,700 cpm. Thus, there was no indication of the presence of radiologically-impacted material and/or an exceedance of the USEPA cleanup threshold of 7.1 pCi/g total radium.

The locations of all soil borings and monitoring wells can be found on the attached Figure

Please contact us with any questions you have regarding this letter or the reported results.

Regards,

Brian R. Schmidt Project Scientist II

cc: Verneta Simon, USEPA

Steven C. Kornder, Ph.D. Senior Project Geoscientist

Attachments: Boring Location Diagram

Down-hole Gamma Results Table

Down-hole Gamma Results June 29, 2011 500 Lake Shore Drive

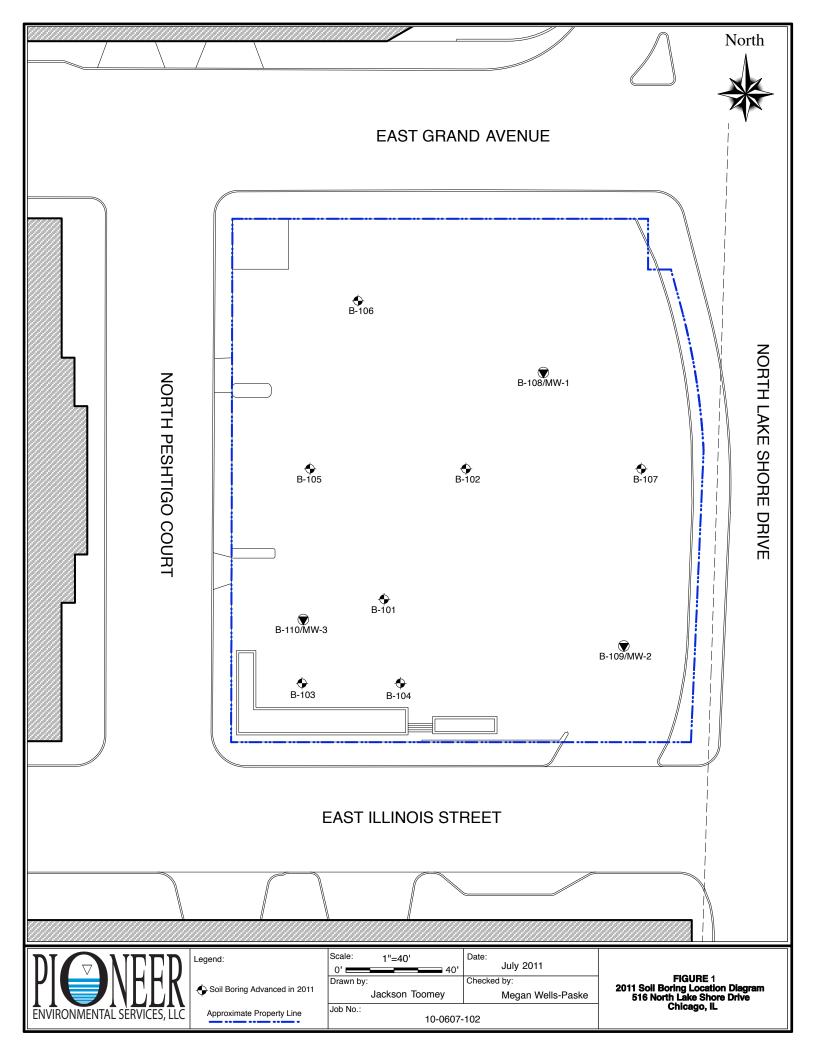
Depth	B-101	B-102	B-103	B-104	B-105	B-106	B-107
(ft-bgs)	DTB: 10.53	DTB: 10.05	DTB: 11.52	DTB: 11.46	DTB: 11.51	DTB: 11.53	DTB: 10.11
0	220	273	269	222	247	279	323
0.5	460		224	198	267	295	
1		689					472
1.5	1513		777	857	1148	1528	
2		1569					1211
2.5	1152		921	1552	2970	1891	
3		2086					1498
3.5	1150		1893	2313	1499	1569	
4		2616					1423
4.5	1251		1435	2642	1664	1381	
5		1660					1140
5.5	1177		894	1675	1778	1214	
6		1306					1196
6.5	2954		1099	1460	920	1158	
7		1155					1135
7.5	1677		1309	1397	824	845	
8		1172					868
8.5	1213		827	911	1210	583	
9		877					880
9.5	1069		896	726	997	505	
10		629					561
10.5	935		1109	911	754	452	
11							
11.5			880	1006	561	533	

Notes: Conducted with a 1/2 by 1-inch NaI probe with a 1-inch lead end cap.

Site down-hole background estimated at 1,200 cpm.

Value equivalent to the USEPA threshold of 7.1 pCi/g is approximately 3,491 cpm.

= Values greater than twice background.



Appendix C

Radiological Soil Sample Analyses

C-1 Gamma Spectroscopy

C-2 Nutrani Analyses

Appendix C-1

Gamma Spectroscopy

```
ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05 RSSI Spectrum name: G110149.An1
```

Sample description

G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

Ti	M M A R Y O F me of Count U Activity uCi/g		D E S I N Sigma Total	SAMPLE	****
PB-214	2.01E-06	9.03E+00%	9.56E+00%		
PB-212	7.10E-05	4.04E-01%	3.37E+00%		
BI-212	8.31E-05	2.53E+00%	3.42E+00%		
AC-228	7.41E-05	9.20E-01%	2.48E+00%		
T1-210 <	2.96E-08				
TL-208	2.36E-05	9.93E-01%	2.54E+00%		
K-40 #	1.46E-05	6.64E+00%	7.01E+00%		
BI-214	2.01E-06	1.17E+01%	1.20E+01%		

- # All peaks for activity calculation had bad shape.
- * Activity omitted from total
- & Activity omitted from total and all peaks had bad shape.
- < MDA value printed.
- A Activity printed, but activity < MDA.
- B Activity < MDA and failed test.
- C Area < Critical level.
- F Failed fraction or key line test.
- H Halflife limit exceeded

----- S U M M A R Y ------- Total Activity (1620.4 to 1897.3 keV) 2.70E-04 uCi/g

The library has energies which are not separable.

This section based on library: 1001a.Lib

ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05 RSSI Spectrum name: G110149.An1

Sample description G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

- Nucli Name		Activity uCi/g		Activity uCi/g				MMENTS
PB-214	N	2.01E-06						
				2.04E-06 1.53E-06			1.48E+01	G
			77.11	2.01E-06	} P	1.85E-06		duplication XA
			241.99			9.91E-07	5.26E+01	G
			4 of	5 peaks	s four	nd		
PB-212	N	7.10E-05						
			238.63	7.10E-05	(P	1.05E-07		
			77.11	6.70E-05	} p	7.32E-07		duplication
							Energy	duplication
				7.62E-05				
				7.05E-05 4 peaks			3.78E+00	G
			1 01	I Poull	200			
BI-212	N	8.31E-05	707 22	0 265 05	(D	1 000 06	0 528.00	G
				8.36E-05 9.16E-05	,			
				8.01E-05				
				9.68E-05			2.17E+01	G
			4 of	4 peaks	s four	nd		
AC-228	N	7.41E-05						
				7.36E-05				
				7.74E-05 7.17E-05				
				7.16E-05				
				6.19E-05			4.24E+00	G
			5 of	5 peaks	s four	nd		
TL-208	N	2.36E-05						
				2.34E-05				
				2.46E-05 2.75E-05	•			
			277.37			7.70E-07		
				2.22E-05			1.64E+01	G
			5 of	5 peaks	s four	nd		
K-40	N	1.46E-05						
				1.46E-05			5.38E+00	G
			1 of	1 peaks	s four	nd		
BI-214	N	2.01E-06						
			609.32		,	1.46E-07		
			1764.49 1120 29	2.85E-06 3.43E-06		3.66E-07 4.61E-07		
				3.43E-06				
			768.36	1.34E-06	- P	1.24E-06	7.94E+01	G

ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05 RSSI Spectrum name: G110149.An1

Sample description G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

5 of 5 peaks found

- (This peak used in the nuclide activity average.
- * Peak is too wide, but only one peak in library.
- ! Peak is part of a multiplet and this area went negative during deconvolution.
- ? Peak is too narrow.
- @ Peak is too wide at FW25M, but ok at FWHM.
- % Peak fails sensitivity test.
- \$ Peak identified, but first peak of this nuclide failed one or more qualification tests.
- + Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
- = Peak outside analysis energy range.
- & Calculated peak centroid is not close enough to the library energy centroid for positive identification.
- P Peakbackground subtraction
- } Peak is too close to another for the activity to be found directly.

Nuclide Codes:

- T Thermal Neutron Activation
- F Fast Neutron Activation
- I Fission Product
- N Naturally Occurring Isotope S Single-Escape
- P Photon Reaction
- C Charged Particle Reaction
- M No MDA Calculation R Coincidence Corrected
- H Halflife limit exceeded

Peak Codes:

- G Gamma Ray
- X X-Ray
 - P Positron Decay
- D Double-Escape
- K Key Line
 - A Not in Average
- C Coincidence Peak

This section based on library: 1001a.Lib

ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05
RSSI Spectrum name: G110149.An1

Sample description G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

		DENTIE		PEAK	SUMM			
Channel	Energy	Background N Counts	Counts	Intensity Cts/Sec 1	Uncert Sigma %	FWHM keV	Nucl	ected ide
137.80	39.01	4696.	3366	. 0.935	4.42	1.128	_	sM
166.21	45.59	4152.	177.	0.049	56.53	0.435	_	sM
202.89	54.10	5154.	283.	0.079	42.54	0.919	_	s
333.23	84.32	10509.	2485.	0.690	6.17	1.432	_	D
345.12	87.07	10834.	7545.	. 2.096	2.27	1.434	-	D
356.93	89.81	11270.	6029.	. 1.675	2.80	1.436	_	D
371.97	93.30	8772.	6649.	. 1.847	2.34	1.438	_	D
398.41	99.45	10246.	1465.	0.407	13.00	1.251	-	
422.82	105.11	9845.	2393.	0.665	8.29	1.743	-	s
438.60	108.77	7851.	552.	0.153	26.70	1.055	_	sD
465.28	114.96	9624.	718.	0.199	29.24	0.926	_	s
495.87	122.05	5868.	562.	0.156	29.24	0.856	_	s
526.30	129.11	12439.	3646.	1.013	5.88	1.093	_	s
578.09	141.12	7741.	213.	0.059	73.23	0.587	_	s
633.30	153.92	9337.	1306.	0.363	13.52	1.199	-	
793.07	190.98	8450.	366.	0.102	49.74	0.676	-	s
871.78	209.24	8913.	5955.	. 1.654	3.28	1.308	_	
941.65	225.44	4293.	388.	0.108	31.27	0.925	_	s
972.69	232.71	6286.	274.	0.076	41.41	1.534	_	D
985.87	235.76	21218.	657.	0.182	31.60	1.536	-	D
1008.58	241.03	46301.	5679.	. 1.577	5.52	1.540	-	D
1011.44	241.63	7887.	262.	0.073	48.38	1.541	_	D
1048.86	250.21	4299.	101.	0.028	91.90	1.547	_	С
1058.45	252.43	4395.	322.	0.090	29.62	1.548	-	D
1134.47	270.17	4940.	4452.	. 1.237	4.15	1.322	-	
1211.38	288.01	3421.	516.	0.143	20.75	1.118	-	s
1288.50	305.90	1802.	354.	0.098	26.64	1.091	-	sM
1383.07	327.83	4242.	3306.		4.31	1.441	-	D
1401.69	332.15	2358.	376.		23.40	1.197	-	sM
1561.01	369.11	1308.	67.		80.99	0.582		sc
1599.28	377.99	1805.	128.		54.16	0.342		s
1692.64	399.65	2564.	429.		27.66	0.388		S
1734.30	409.31	2398.	1821.		6.02	1.301		
1839.47	433.71	1773.	204.	0.057	37.62	0.660	-	s
1921.83	452.82	1743.	455.		18.38	0.937		s
2394.16	562.41	2011.	775.		14.99	1.522		
2621.74	615.21	784.	64.		67.41	0.397		C
2727.17	639.67	1563.	208.	0.058	40.42	0.716	-	s
2753.70	645.83	1285.	288.		28.90	0.637		s
2855.10	669.36	668.	52.	0.015	72.92	0.599	-	sc
2923.92	685.33	1116.	234.		36.22	0.639		S
3083.12	722.27	749.	62.	0.017	69.55	0.569	-	sc
3133.87	734.36	833.	137.	0.038	30.94	1.895	-	D
3148.41	737.73	781.	103.	0.029	39.74	1.897	-	D
3224.64	755.21	940.	677.	0.188	7.47	1.910	-	D
3239.58	758.68	1375.	65.	0.018	81.22	1.913	-	С
3297.83	772.19	1042.	839.		6.44	1.923		D
3339.63	781.87	1097.	344.	0.096	14.63	1.930	-	D
3395.56	794.78	742.	2356		3.41	1.618		
3527.94	825.46	629.	115.		32.12	1.963	-	D
3548.22	830.17	573.	324.	0.090	11.83	1.966	-	D
3571.02	835.51	599.	919.	0.255	5.00	1.970	-	D

ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05 RSSI Spectrum name: G110149.An1

Sample description

G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

D	-	1.974	8.69	0.133	479.	628.	840.32	3591.75
sM	-	0.841	17.72	0.110	395.	674.	903.62	3864.52
s	-	1.550	19.03	0.063	227.	345.	1064.56	4557.88
sD	-	0.547	55.68	0.006	20.	52.	1073.05	4594.47
s	-	1.099	15.59	0.102	366.	369.	1078.49	4617.92
s	-	1.258	16.97	0.082	296.	414.	1110.21	4754.56
s	-	0.392	41.28	0.024	85.	217.	1130.25	4840.88
s	-	0.527	44.63	0.016	58.	153.	1142.64	4894.24
s	-	0.380	51.19	0.011	38.	110.	1204.98	5162.78
s	_	0.663	62.20	0.012	42.	130.	1471.48	6310.55
s	-	0.867	13.55	0.103	372.	255.	1495.38	6413.45
s	-	0.389	34.76	0.014	50.	63.	1543.28	6619.74
D	_	2.557	3.56	0.336	1209.	322.	1588.12	6812.77
D	_	2.560	7.26	0.166	596.	639.	1592.29	6830.73
sM	-	2.084	7.24	0.165	595.	180.	1630.70	6996.15
s	_	0.642	54.45	0.006	22.	42.	1809.57	7766.24
s	-	0.798	27.06	0.033	118.	138.	1842.37	7907.41

s - Peak fails shape tests.

This section based on library: 1001a.Lib

D - Peak area deconvoluted.

L - Peak written from unknown list.

C - Area < Critical level.

M - Peak is close to a library peak.

```
ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05
RSSI
                               Spectrum name: G110149.An1
Sample description
    G110149 AECOM I-1.9-2' 404.7g
Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1
Acquisition information
      Start time:
                                  02-Sep-2011 10:35:03
      Live time:
                               3600
      Real time:
                               3643
                                 1.17 %
      Dead time:
      Detector ID:
                                     1
Detector system
    USER-802B915354 MCB 9
Calibration
      Filename:
                                  G110149.An1
    08/12/11 calibration
      Energy Calibration
           Created:
                                  02-Sep-2011 10:26:59
           Zero offset:
                                  7.050 keV
           Gain:
                                 0.232 keV/channel
           Ouadratic:
                                  2.516E-08 keV/channel^2
      Efficiency Calibration
                                 12-Aug-2011 14:44:46
           Created:
           Type:
                                 Polynomial
           Uncertainty:
                                 0.018 %
                                                      0.819619
           Coefficients:
                                -0.028850 -5.092721
                                -0.106686 0.005580 -0.000121
Library Files
                                1001a.Lib
      Main analysis library:
      Library Match Width:
                                 0.500
      Peak stripping:
                                  Library based
Analysis parameters
      Analysis engine:
                                 Env32 G53W4.22
      Start channel:
                                20 (
                                       11.69keV )
      Stop channel:
                               8144 ( 1897.33keV )
                               100.000%
      Peak rejection level:
      Peak search sensitivity:
                                 2
      Sample Size:
                                  4.0470E+02
                                 1.0000E+00/(1.0000E+00*4.0470E+02) =
      Activity scaling factor:
                                  2.4710E-03
                                 Traditional ORTEC method
      Detection limit method:
      Random error:
                                 1.000000E+00
      Systematic error:
                                 1.000000E+00
      Fraction Limit:
                                10.000%
      Background width:
                                 best method (based on spectrum).
      Half lives decay limit: 12.000
      Activity range factor:
                                2.000
      Min. step backq. energy
                                0.000
      Multiplet shift channel
                                 2.000
Corrections
                                                   Comments
                                   Status
```

NO

Decay correct to date:

ORTEC g v - i (1215) Env32 G53W4.22 02-SEP-2011 11:40:05 RSSI Spectrum name: G110149.An1

Sample description

G110149 AECOM I-1.9-2' 404.7g

Spectrum Filename: H:\GammaVision\User\Spectra\G110149.An1

Decay during acquisition: NO
Decay during collection: NO
True coincidence correction: NO

Peaked background correction: YES 10_12_30 30%.Pbc

30-Dec-2010 10:17:12

Absorption (Internal): NO
Geometry correction: NO
Random summing: NO

total peaks alloc. 29 cutoff 20.00000 %

Energy Calibration

Normalized diff: 0.1179

Laboratory: RSSI

Appendix C-2

Nutranl Analyses

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Summary Report September 12, 2011 - September 15, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group		(g)	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3619	9/12/2011	background	bkg091211	7.5	3.61	3.45	0.15	1.05	0.22	1.33	0.37	1.69
3620	9/12/2011	soil standard	soilstd091211	36.9	2.96	6	4.09	1.81	3.83	2.38	7.92	2.99
3621	9/12/2011	515 Peshtigo	I-3.5 East Wall 7k spot	20.6	7.15	5.81	1.79	1.69	5.3	2.39	7.09	2.93
3622	9/12/2011	515 Peshtigo	I-3.5 North Wall 5-7k comp	23.6	6.01	4.59	0.86	1.36	4.15	1.85	5.01	2.30
3623	9/12/2011	515 Peshtigo	S6459 Bag #1 11k	31	9.29	5.07	1.26	1.49	5.42	2.07	6.68	2.55
3624	9/12/2011	515 Peshtigo	S6460 Bag #2 12k	30	-0.03	5.39	0.73	1.63	10.24	2.41	10.97	2.91
3625	9/12/2011	515 Peshtigo	S6461 Bag #3 10k	28.1	14.71	6.94	0.6	2	8.56	2.79	9.16	3.43
3626	9/12/2011	515 Peshtigo	S6462 Bag #4 9k	25.9	15.16	4.39	1.34	1.25	7.04	1.73	8.38	2.13
3627	9/12/2011	515 Peshtigo	S6463 Bag #5 8.5k	27.6	2.72	5.52	1.82	1.69	7.82	2.32	9.64	2.87
3628	9/12/2011	515 Peshtigo	S6464 Bag #6 8k	26.3	10.81	6.07	1.37	1.79	6.03	2.38	7.4	2.98
3629	9/12/2011	515 Peshtigo	S6465 Bag #7 7.5k	25.2	14.93	5.51	1.32	1.56	4.89	2.1	6.21	2.62
3630	9/12/2011	515 Peshtigo	S6466 Bag #8 11k	29	18.52	7.94	0.52	2.13	5.55	3.09	6.07	3.75
3631	9/12/2011	515 Peshtigo	S6467 Bag #9 10k	29.2	12.17	5.44	1.9	1.56	5.56	2.15	7.46	2.66
3632	9/12/2011	515 Peshtigo	S6468 Bag #10 8k	29.5	5.27	4.12	0.62	1.24	6.52	1.76	7.14	2.15
3633	9/12/2011	515 Peshtigo	S6469 Bag #11 8k	28.5	5.9	5.08	0.73	1.48	4.07	2.11	4.8	2.58
3634	9/12/2011	515 Peshtigo	S6470 Bag #12 9k	29.2	9.36	4.42	1.1	1.29	4.47	1.77	5.57	2.19
3635	9/12/2011	515 Peshtigo	S6471 Bag #13 7.5k	27.4	3.34	5.44	2.15	1.64	7.03	2.24	9.18	2.78
3636	9/12/2011	515 Peshtigo	S6472 Bag #14 10.5k	27.8	23.04	6.67	0.93	1.85	7.89	2.56	8.82	3.16
3637	9/12/2011	515 Peshtigo	S6473 Bag #15 13k	24.7	23.05	7.82	0.79	2.21	16.05	3.14	16.84	3.84
3638	9/12/2011	515 Peshtigo	S6474 Bag #16 10k	28.5	12.65	7.26	1.44	2.08	7.97	2.85	9.41	3.53
3639	9/12/2011	515 Peshtigo	S6475 Bag #17 11k	27	19.22	7.63	0.67	2.16	8.87	2.98	9.54	3.68
3640	9/12/2011	515 Peshtigo	S6476 Bag #18 15k	25.7	24.91	10.02	-0.02	2.91	19.48	4.14	19.46	5.06
3641	9/12/2011	515 Peshtigo	S6477 Bag #19 18k	27.4	15.24	5.37	0.74	1.55	7.67	2.13	8.41	2.63
3642	9/12/2011	515 Peshtigo	S6478 Bag #20 12k	25.3	12.92	7.24	2.4	2.05	6.96	2.83	9.36	3.49
3643	9/12/2011	515 Peshtigo	S6479 Bag #21 11k	29.9	18.17	4.63	2.79	1.29	5.49	1.76	8.28	2.18
3644	9/12/2011	515 Peshtigo	S6480 Bag #22 7.5k	28	11.69	5.4	1.64	1.56	4.94	2.13	6.58	2.64
3645	9/12/2011	515 Peshtigo	S6481 Bag #23 7k	23.3	11.44	4.62	0.97	1.34	3.54	1.8	4.51	2.24
3646	9/12/2011	515 Peshtigo	S6482 Bag #24 7k	22.8	1.6	4.66	0.71	1.42	6.82	1.98	7.53	2.44
3647	9/13/2011	background	bkg091311	7.5	6.03	4.17	-0.63	1.19	0.54	1.67	-0.09	2.05
3648	9/13/2011	soil standard	soilstd091311	36.9	8.72	5.06	4.26	1.51	3.55	1.93	7.81	2.45
3649	9/13/2011	515 Peshtigo	S6483 Bag #25 8k	25.9	1.12	4.41	3.22	1.34	1.51	1.76	4.73	2.21
3650	9/13/2011	515 Peshtigo	S6484 Bag #26 7k	26.9	5.76	4.33	1.18	1.32	5.15	1.75	6.33	2.19
3651	9/13/2011	515 Peshtigo	S6485 Bag #27 8k	29.4	12.58	6.09	0.74	1.71	4.6	2.41	5.34	2.96
3652	9/13/2011	515 Peshtigo	S6486 Bag #28 51k	24.4	14.64	26.28	60.13	7.52	1.01	8.93	61.14	11.67
3653	9/13/2011	515 Peshtigo	S6487 Bag #29 69k	26.7	48.42	35.51	104.01	10.01	0.6	11.83	104.61	15.50
3654	9/13/2011	515 Peshtigo	S6488 Bag #30 28k	24.8	6.26	8.35	8.22	2.45	3.3	3.16	11.52	4.00
3655	9/13/2011	515 Peshtigo	S6489 Bag #31 91k	21.2	36.8	36.6	106.31	10.34	-4.56	12.16	101.75	15.96

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group		(g)	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3656	9/13/2011	515 Peshtigo	S6490 Bag #32 28k	20.5	12.74	22.88	61.02	6.59	-2.29	7.7	58.73	10.13
3657	9/13/2011	515 Peshtigo	S6491 Bag #33 22k	21.4	14.92	9.19	21.52	2.62	1.78	3.21	23.3	4.14
3658	9/13/2011	515 Peshtigo	S6492 Bag #34 13k	24.8	12.48	9.85	16.67	2.88	2.78	3.53	19.45	4.56
3660	9/15/2011	background	bkg091511	7.5	5.02	4.47	-0.1	1.3	-0.21	1.74	-0.31	2.17
3661	9/15/2011	soil standard	soilstd091511	36.9	6.11	5.34	4.77	1.59	2.89	2	7.66	2.56
3662	9/15/2011	515 Peshtigo	S6494 Bag #35 7.5k	23.2	7.62	7.35	4.84	2.11	2.54	2.83	7.38	3.53
3663	9/15/2011	515 Peshtigo	S6495 Bag #36 10k	25.1	10.54	12.9	10.58	3.65	1.91	4.67	12.49	5.93
3664	9/15/2011	515 Peshtigo	S6496 I-1.9 S. Wall 32k	28.3	24.51	17.54	38.73	4.97	-1.78	5.81	36.95	7.65
3665	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #1	20.7	11.72	5.9	0.12	1.71	4.21	2.31	4.33	2.87
3666	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #2	22.1	3.52	4.7	1.63	1.42	4.24	1.91	5.87	2.38
3667	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #3	21	6.87	5.08	-0.22	1.53	5.2	2.08	4.98	2.58
3668	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #4	21	5.96	3.9	2.73	1.15	1.67	1.52	4.4	1.91
3669	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #5	20.3	4.4	5.85	1.14	1.75	5.34	2.39	6.48	2.96
3670	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #1	18.1	5.31	6.2	0.27	1.85	2.84	2.42	3.11	3.05
3671	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #2	16.8	9.61	5.4	0.31	1.5	1.23	2.06	1.54	2.55
3672	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #3	17.4	-2.03	3.95	1.96	1.24	2.32	1.65	4.28	2.06
3673	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #4	17.4	3.62	3.27	0.97	0.99	1.44	1.3	2.41	1.63
		515 Peshtigo EPA	I-1.9 EPA #5	20.1	2.51	4.99	0.81	1.52	2.58	2.02	3.39	2.53
3675	9/15/2011	515 Peshtigo EPA	I-3.5 North Wall Spot	20.9	4.85	4.65	1.27	1.38	3.16	1.85	4.43	2.31

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Summary Report - Samples Collected on November 22 - December 6, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group		(g)	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
		background	bkg112311	7.5	2.28	4.45	-0.1	1.35	0.14	1.86	0.04	2.30
3680	11/23/2011	soil standard	soilstd112311	36.9	9.98	5.18	4.45	1.54	3.65	1.98	8.1	2.51
3681	11/23/2011	soil standard	soilstd112311(2)	36.9	6.1	7.02	5.06	2.07	2.51	2.67	7.57	3.38
3682	11/23/2011	515 Peshtigo	S6509 Bag #37	24.7	17.6	13.59	17.32	3.99	27.96	5.33	45.28	6.66
3683	11/23/2011	515 Peshtigo	S6510 Bag #38	24.8	9.64	10.33	8.46	3.01	10.05	3.95	18.51	4.97
3684	11/23/2011	515 Peshtigo	S6511 Bag #39	24.5	11.56	5.01	1.37	1.44	3.23	1.9	4.6	2.38
3685	11/23/2011	515 Peshtigo	S6512 Bag #40	23.7	50.22	29.45	27.61	8.57	98.07	12.01	125.68	14.75
3686	11/23/2011	515 Peshtigo	S6513 Bag #41	23.1	11.79	7.13	4.71	2.1	12.37	2.87	17.08	3.56
3687	11/23/2011	515 Peshtigo	S6514 Bag #42	23	72.64	39.3	20.78	11.52	155.15	16.56	175.93	20.17
3688	11/23/2011	515 Peshtigo	S6515 Bag #43	24.3	4.26	6.27	4.6	1.91	11.48	2.56	16.08	3.19
3689	11/23/2011	515 Peshtigo	S6516 Bag #44	23.6	21.29	12.66	17.68	3.67	17.51	4.8	35.19	6.04
3690	11/23/2011	515 Peshtigo	S6517 Bag #45	25.9	18.67	7.99	0.78	2.27	13.79	3.23	14.57	3.95
3691	11/23/2011	515 Peshtigo	S6518 Bag #46	24.6	15.41	5.54	2.87	1.58	5.02	2.07	7.89	2.60
3692	11/23/2011	515 Peshtigo	S6519 Bag #47	28.6	12.78	8.08	2.07	2.28	5.87	3.12	7.94	3.86
3693	11/23/2011	515 Peshtigo	S6520 Bag #48	26	12.37	5.7	2.41	1.69	9.09	2.27	11.5	2.83
3694	11/23/2011	515 Peshtigo	S6521 Bag #49	25.9	17.26	7.05	1.15	2.01	9.66	2.75	10.81	3.41
3695	11/23/2011	515 Peshtigo	S6522 Bag #50	24	3.16	4.59	1.44	1.42	6.54	1.95	7.98	2.41
		515 Peshtigo	S6523 Bag #51	29.4	8.45	6.03	3.08	1.76	5.77	2.4	8.85	2.98
3697	11/29/2011	background	bkg112911	7.5	3.07	4.54	-0.45	1.36	0.03	1.83	-0.42	2.28
3698	11/29/2011	soil standard	soilstd112911	36.9	10.57	5.83	6.12	1.69	2.15	2.19	8.27	2.77
3699	11/29/2011	515 Peshtigo	S6524 Bag #52	26.9	8.24	6.84	8.02	1.99	5.79	2.59	13.81	3.27
3700	11/29/2011	515 Peshtigo	S6525 Bag #53	29.2	14.64	7.77	3.23	2.22	8.5	3.02	11.73	3.75
3701	11/29/2011	515 Peshtigo	S6526 Bag #54	30	17.94	7.02	6.99	2.03	9.35	2.68	16.34	3.36
3702	11/29/2011	515 Peshtigo	S6527 Bag #55	29.1	6.46	5.46	2.75	1.62	5.37	2.24	8.12	2.76
3703	11/29/2011	515 Peshtigo	S6528 Bag #56	26.4	12.12	9.13	7.66	2.61	11.93	3.55	19.59	4.41
3704	11/29/2011	515 Peshtigo	S6529 Bag #57	23.6	58.82	40.93	54.51	11.77	82.57	15.84	137.08	19.73
		515 Peshtigo	S6530 Bag #58	27.8	8.12	6.37	1.99	1.87	5.02	2.51	7.01	3.13
3706	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #1	25.6	5.81	5.69	1.47	1.67	2.29	2.22	3.76	2.78
3707	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #2	25.2	10.4	5.8	2.7	1.68	1.18	2.18	3.88	2.75
3708	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #3	27	11.31	6.55	0.06	1.9	4.58	2.63	4.64	3.24
3709	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #4	25.7	6.21	5.1	0.95	1.52	2.81	2.01	3.76	2.52
3710	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #5	26	2.46	5.24	2.8	1.57	2.63	2.07	5.43	2.60
3711	12/5/2011	background	bkg120511	7.5	7.23	4.22	-0.63	1.23	0.43	1.71	-0.2	2.11
3712	12/5/2011	soil standard	soilstd120511	36.9	12.98	6.36	4.1	1.81	3.64	2.41	7.74	3.01
3713	12/5/2011	515 Peshtigo	S6536 Bag #59	25.3	14.7	7.38	9.42	2.08	-0.33	2.56	9.09	
3714	12/5/2011	515 Peshtigo	S6537 Bag #60	29.4	12.05	5.82	10.11	1.72	-1.38	2.02	8.73	2.65

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group		(g)	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3715	12/5/2011	515 Peshtigo	S6538 Bag #61	24.3	-0.91	5.11	3.98	1.59	0.84	1.98	4.82	2.54
3716	12/5/2011	515 Peshtigo	S6539 Bag #62	25.3	9.03	12.14	25.4	3.51	0.51	4.19	25.91	5.47
3717	12/5/2011	515 Peshtigo	S6540 I-1.9 South Wall	23.5	21.08	14.66	34.37	4.17	2.56	4.97	36.93	6.49
3718	12/5/2011	515 Peshtigo	S6541 Bag #63	27.3	9.17	9.06	19.32	2.65	4.11	3.29	23.43	4.22
3719	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #1	27.3	10.42	3.85	0.51	1.12	1.87	1.45	2.38	1.83
3720	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #2	26.1	2.27	3.61	1.66	1.09	2.71	1.45	4.37	1.81
3721	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #3	27.2	12.18	5.17	0.82	1.47	3.28	1.96	4.1	2.45
3722	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #4	26	11.1	5.22	0.32	1.55	3.75	2.04	4.07	2.56
3723	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #5	26.6	8.64	7.23	2.38	2.07	0.74	2.74	3.12	3.43
3724	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #1	27.5	2.82	7.13	3.24	2.06	1.88	2.84	5.12	3.51
3725	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #2	26.2	10.54	5.58	0.47	1.63	3.53	2.21	4	2.75
3726	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #3	27.2	0.62	5.55	2.97	1.7	0.76	2.13	3.73	2.73
3727	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #4	26.3	5.34	3.1	2.6	0.92	-0.21	1.16	2.39	1.48
3728	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #5	26.5	7.52	5.18	2.19	1.51	2.9	2.01	5.09	2.51
3729	12/6/2011	background	bkg120611	7.5	2.75	4.1	-0.32	1.23	0.62	1.69	0.3	2.09
3730	12/6/2011	soil standard	soilstd120611	36.9	4.87	5.86	5.65	1.75	1.64	2.23	7.29	2.83
3731	12/6/2011	515 Peshtigo	S6552 Bag #64	27.3	9.14	9.11	7.17	2.74	11.38	3.59	18.55	4.52
3732	12/6/2011	515 Peshtigo	S6553 Bag #65	30.6	14.41	9.59	12.66	2.82	8.01	3.55	20.67	4.53
3733	12/6/2011	515 Peshtigo	S6554 Bag #66	31.6	12.2	8.47	19	2.48	6.41	3.11	25.41	3.98
3734	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #1	35.2	7.78	5.83	1.99	1.7	1.03	2.2	3.02	2.78
3735	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #2	35.4	8.87	6.32	2.04	1.84	-0.42	2.32	1.62	2.96
3736	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #3	32.6	4.4	5.73	2.56	1.71	1.23	2.31	3.79	2.87
3737		515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #4	33.7	1.7	5.67	1.88	1.72	2.53	2.28	4.41	2.86
3738	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #5	35.8	5.46	4.71	1.05	1.39	2.76	1.9	3.81	2.35

All results are in pCi/gram

^{**} Important Note: System has not been calibrated for U-238 and the analytical results detailed above for U-238 should not be used or considered accurate

Appendix D

USEPA Signed
Notification of
Successful Verification
Sampling Forms

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – Location I-1,9
Date of Verification Survey: 9/15/11
Time of Verification Survey: 7:30AM
The above-described excavation was surveyed at the time and date indicated above. The surve indicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed: Signed:
Date: 9/15/11
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 or Contained in the Administrative Settlement Agreement and Order on Consent.
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Date 9/15///
Print Name VERNETH Simon
Print Title On-Scene Cookdinator
For USEPA Region 5

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – Location I-3.5
Date of Verification Survey: 9/15/11
Time of Verification Survey: 7:00AM
The above-described excavation was surveyed at the time and date indicated above. The surveindicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed: Steve Kornelan
Date: 9/15/11
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 or The results of this survey indicate that the verification criteria as contained in the Administrative Settlement Agreement and Order on Consent.
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Date 9/15/11
Print Name Veencha Simon
Print Title On-Scene Coordinator
For USEPA Region 5

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Exclusion Zone Confirmatory Samples for September 15, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3665	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #1	20.7	11.72	5.9	0.12	1.71	4.21	2.31	4.33	2.87
3666	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #2	22.1	3.52	4.7	1.63	1.42	4.24	1.91	5.87	2.38
3667	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #3	21	6.87	5.08	-0.22	1.53	5.2	2.08	4.98	2.58
		515 Peshtigo EPA		21	5.96	3.9	2.73	1.15	1.67	1.52	4.4	1.91
3669	9/15/2011	515 Peshtigo EPA	I-3.5 EPA #5	20.3	4.4	5.85	1.14	1.75	5.34	2.39	6.48	2.96
3675	9/15/2011	515 Peshtigo EPA	* I-3.5 North Wall Spot	20.9	4.85	4.65	1.27	1.38	3.16	1.85	4.43	2.31

Average Total Radium (Th-232+Ra-226) Concentration for: I-3.5 515 Peshtigo Exclusion Zone = 5.21 pCi/g

* Additional spot sample taken by Verneta Simon on North Wall of I-3.5 Exclusion Zone - Not included in average

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3670	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #1	18.1	5.31	6.2	0.27	1.85	2.84	2.42	3.11	3.05
3671	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #2	16.8	9.61	5.4	0.31	1.5	1.23	2.06	1.54	2.55
3672	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #3	17.4	-2.03	3.95	1.96	1.24	2.32	1.65	4.28	2.06
3673	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #4	17.4	3.62	3.27	0.97	0.99	1.44	1.3	2.41	1.63
3674	9/15/2011	515 Peshtigo EPA	I-1.9 EPA #5	20.1	2.51	4.99	0.81	1.52	2.58	2.02	3.39	2.53
Avera	ge Total	Radium (Th-23	32+Ra-226) Cor	ncentration f	or:	I-1.9 5′	I5 Pesl	htigo Exc	clusion	Zone =	2.95	pCi/g

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – Location F4.4-I4.4
Date of Verification Survey: 11/29/11
Time of Verification Survey: 3:30PM
The above-described excavation was surveyed at the time and date indicated above. The survey indicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed:
Date: <u>11/29/11</u>
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 on The results of this survey indicate that the verification criteria as contained in the Administrative Settlement Agreement and Order on Consent.
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Date 1/30/1/
Print Name VERIZETA SINZEIT
Print Title On-Scene Coordinator
For USEPA Region 5

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Exclusion Zone Confirmatory Samples for November 29, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3706	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #1	25.6	5.81	5.69	1.47	1.67	2.29	2.22	3.76	2.78
3707	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #2	25.2	10.4	5.8	2.7	1.68	1.18	2.18	3.88	2.75
3708	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #3	27	11.31	6.55	0.06	1.9	4.58	2.63	4.64	3.24
3709	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #4	25.7	6.21	5.1	0.95	1.52	2.81	2.01	3.76	2.52
3710	11/29/2011	515 Peshtigo EPA	F4.4-I4.4 EPA #5	26	2.46	5.24	2.8	1.57	2.63	2.07	5.43	2.60

Average Total Radium (Th-232+Ra-226) Concentration for: F4.4 - I4.4 Exclusion Zone 4.29 pCi/g

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – Location I1.9 (just north of sidewalk)
Date of Verification Survey: 12/5/11
Time of Verification Survey: 3:00PM
The above-described excavation was surveyed at the time and date indicated above. The survey indicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed:
Date: 12/5/11
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 or 12
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Date 12/14/11
Print Name VERNERS Simon
Print Title On-Scene Coredinator
For USEPA Region 5

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – Location D.1/E.1 – D.2/E.2
Date of Verification Survey: 12/5/11
Time of Verification Survey: 3:30PM
The above-described excavation was surveyed at the time and date indicated above. The surveindicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed: **The Complete Complet
Date: 12/5/11
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 or Contained in the Administrative Settlement Agreement and Order on Consent.
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Print Name VERNERA SIMON
Print Title On-Scene Covedinator
For USEPA Region 5

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Exclusion Zone Confirmatory Samples for December 5, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3719	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #1	27.3	10.42	3.85	0.51	1.12	1.87	1.45	2.38	1.83
3720	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #2	26.1	2.27	3.61	1.66	1.09	2.71	1.45	4.37	1.81
3721	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #3	27.2	12.18	5.17	0.82	1.47	3.28	1.96	4.1	2.45
3722		515 Peshtigo EPA		26	11.1	5.22	0.32	1.55	3.75		-	2.56
3723	12/5/2011	515 Peshtigo EPA	I-1.9 EPA #5	26.6	8.64	7.23	2.38	2.07	0.74	2.74	3.12	3.43

Average Total Radium (Th-232+Ra-226) Concentration for: I-1.9 Exclusion Zone 3.61 pCi/g

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3724	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #1	27.5	2.82	7.13	3.24	2.06	1.88	2.84	5.12	3.51
3725	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #2	26.2	10.54	5.58	0.47	1.63	3.53	2.21	4	2.75
3726	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #3	27.2	0.62	5.55	2.97	1.7	0.76	2.13	3.73	2.73
3727	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #4	26.3	5.34	3.1	2.6	0.92	-0.21	1.16	2.39	1.48
3728	12/5/2011	515 Peshtigo EPA	D.1/E.1-D.2/E.2 EPA #5	26.5	7.52	5.18	2.19	1.51	2.9	2.01	5.09	2.51

Average Total Radium (Th-232+Ra-226) Concentration for: D.1/E.1 - D.2/E.2 Exclusion Zone 4.07 pCi/g

All results are in pCi/gram

^{**} Important Note: System has not been calibrated for U-238 and the analytical results detailed above for U-238 should not be used or considered accurate

FORM 223-1 NOTIFICATION OF SUCCESSFUL VERIFICATION SURVEY

Area Identification: 515 N Peshtigo Ct – A.2/A.3-B.2/B.3
Date of Verification Survey: 12/6/11
Time of Verification Survey: 3:00PM
The above-described excavation was surveyed at the time and date indicated above. The surve indicated that all soils have been removed as required by the Site Removal Action Criteria.
Documents pertaining to this survey are attached for review and approval by the USEPA. Signed:
Date: 12/6/11
Print Name Steve Kornder
Print Title Senior Project Geochemist
AECOM
The attached Verification Survey documents were reviewed by USEPA, Region 5 or 12711
Authorization is hereby granted to commence backfill and restoration work at this excavation.
Date 12/7///
Print Name VERNETS, men
Print Title <u>On-Scene Covedinator</u>
For USEPA Region 5

Gamma Spec Report - AECOM 515 Peshtigo Ct.

Stan A. Huber Consultants, Inc. 200 North Cedar Road New Lenox, IL 60451 (800) 383-0468

Instrument ID:

Canberra Genie 2000 Nal Gamma Spec System 2"x2" Nal detector w/ pulse height analysis software package

Exclusion Zone Confirmatory Samples for December 6, 2011

Sample	Analysis	Sample	Description	Weight	U-238	U-238	Th-232	Th-232	Ra-226	Ra-226	Total Radium	Total Radium
ID	Date	Group			Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty	Activity	Uncertainty
3734	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #1	35.2	7.78	5.83	1.99	1.7	1.03	2.2	3.02	2.78
3735	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #2	35.4	8.87	6.32	2.04	1.84	-0.42	2.32	1.62	2.96
3736	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #3	32.6	4.4	5.73	2.56	1.71	1.23	2.31	3.79	2.87
3737	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #4	33.7	1.7	5.67	1.88	1.72	2.53	2.28	4.41	2.86
3738	12/6/2011	515 Peshtigo EPA	A.2/A.3-B.2/B.3 EPA #5	35.8	5.46	4.71	1.05	1.39	2.76	1.9	3.81	2.35

Average Total Radium (Th-232+Ra-226) Concentration for: A.2/A.3 - B.2/B.3 Exclusion Zone 3.33 pCi/g

All results are in pCi/gram

^{**} Important Note: System has not been calibrated for U-238 and the analytical results detailed above for U-238 should not be used or considered accurate

Appendix E

USEPA Contract Laboratory Analytical Data



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OFFICE OF RADIATION AND INDOOR AIR

National Air and Radiation Environmental Laboratory 540 South Morris Avenue, Montgomery, AL 36115-2601 (334) 270-3400

November 21, 2013

MEMORANDUM

SUBJECT:

Radiochemical Results for an Carthite

Lindsay Light Samples

FROM:

Cynthia White, Director

Center for Environmental Radioanalytical Laboratory Science

TO:

Eugene Jablonowski, Health Physicist

Region 5

Attached is a data package for gamma analysis of samples collected in Streeterville, Illinois. The samples constitute NAREL batch number 1300082.

Specific information concerning all aspects of the radiological analysis of the samples is contained in the batch case narratives of the data packages. If you have any questions concerning the analytical results, please contact me at (334)270-7052.

Due to a reorganization within the Office of Radiation and Indoor Air, the National Air and Radiation Environmental Laboratory is now called the National Analytical Radiation Environmental Laboratory. (Acronym remains the same, NAREL.)

Attachments

U.S.ENVIRONMENTAL PROTECTION AGENCY NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY 540 S. MORRIS AVE., MONTGOMERY, AL 36115 GAMMA ANALYSES

REPORT OF SAMPLE DELIVERY GROUP #1300082

Project: Lindsay Light - Peshitigo Court, Streeterville, IL

Analysis method: Gamma Spectrometry Report ID: 1300082-GAMMA

Report type: Original Date reported: 11/20/2013

Total pages in report: 13

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B3.09924F	F4.4-I4.4	IL:STREETERVILLE	SOIL	11/29/2011	09/24/2013
B3.09925G	I1.9	IL:STREETERVILLE	SOIL	12/05/2011	09/24/2013
В3.09926Н	D1/E1-D2/E2	IL:STREETERVILLE	SOIL	12/05/2011	09/24/2013
В3.09927Ј	A.2/A.3-B.2/B.3	IL:STREETERVILLE	SOIL	12/06/2011	09/24/2013

EXCEPTIONS

- 1. **Packaging and shipping** No problems were observed.
- 2. **Documentation** No problems were observed.
- 3. **Sample preparation** No problems were encountered.
- 4. **Analysis** Samples were sealed and held for 21 days to allow for in-growth before gamma analysis was performed.
- 5. **Holding times** No holding times were specified.

QUALITY CONTROL

- 1. **QC samples** All QC analysis results met NAREL acceptance criteria.
- 2. **Instruments** Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

Report: 1300082-GAMMA - 1 - Original

ACCREDITATION



All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Mary F. Wisdom

Quality Assurance Manager, NAREL

11-21-13

Cynthia White

Director, Center for Environmental Radioanalytical

Laboratory Science

GENERAL INFORMATION

SAMPLE TYPES

BLD Blind sample FBK Field blank SAM Normal sample

ANALYSIS OC TYPES

ANA Normal analysis
DUP Laboratory duplicate

LCS Laboratory control sample, or blank spike

MS Matrix spike

MSD Matrix spike duplicate (not currently analyzed)

RBK Method blank

STD External standard (used for ²²⁸Ra yield determination)

QUALITY INDICATORS

RPD Relative Percent Difference

%R Percent Recovery

Z Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or RPD, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of RPD in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \le 3$ or $RDD \le RDD$ or RDD

Report: 1300082-GAMMA - 3 - Original

GENERAL INFORMATION (CONTINUED)

GAMMA ANALYSIS

The reporting format lists the gamma emitters in alphabetical order. The activity, 2-sigma uncertainty, and a sample-specific estimate of the MDC for radionuclides measured by gamma spectroscopy are reported only if the nuclide is detected above background with the exception of client requested nuclides of interest. The activity for each of the requested nuclides is reported whether negative, positive, or zero along with the associated 2-sigma uncertainty and the sample-specific estimate of the MDC.

Due to potential spectral interferences and other possible problems associated with the determination of the activity of certain radionuclides, the activities for ²¹⁴Bi, ²¹⁴Pb, ²³⁴Th, ^{234m}Pa, ²²⁶Ra, ²³¹Th, and ²³⁵U are subject to greater uncertainty than other commonly reported radionuclides. It should be noted that this potential uncertainty is not included in the two-sigma expanded uncertainty that is reported with each result. Although in this report we do provide the calculated activities for these radionuclides, we recommend that the results be used only as a qualitative means of indicating the presence of these radionuclides and not as a quantitative measure of their concentration. The results for these nuclides are not used in the evaluation of quality control samples. Furthermore, because of mutual interference between ²²⁶Ra and ²³⁵U, NAREL's gamma analysis software tends to overestimate the amounts of these nuclides whenever both are present in a sample. Lower estimates for ²²⁶Ra activities can be obtained from the reported activities of its decay products, ²¹⁴Pb and ²¹⁴Bi, which are likely to be somewhat less than the ²²⁶Ra activity because of the potential escape of radon gas.

NAREL's gamma-ray spectrometry software corrects activities and MDCs for decay between collection and analysis, but only up to a limit of twelve half-lives. If the decay time for a sample exceeds twelve half-lives of a radionuclide, that radionuclide is not reported. This software feature may affect results for short-lived radionuclides, such as ¹³¹I and ¹⁴⁰Ba, when there is a long delay between collection and analysis.

Report: 1300082-GAMMA - 4 - Original

SDG #1300082

ANALYSIS SUMMARY

Analysis method: NAREL GAM-01
Title: Gamma Spectrometry

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B3.09924F	F4.4-I4.4		11/15/2013	0010500M	0017548V
B3.09924F	F4.4-I4.4	DUP	11/16/2013	0010500M	0017548V
B3.09925G	I1.9		11/15/2013	0010500M	0017548V
В3.09926Н	D1/E1-D2/E2		11/16/2013	0010500M	0017548V
В3.09927Ј	A.2/A.3-B.2/B.3		11/16/2013	0010500M	0017548V
LCS-00678726W *		LCS	11/16/2013	0010500M	0017548V
RBK-00678727X *		RBK	11/16/2013	0010500M	0017548V

^{*} Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

Report: 1300082-GAMMA - 5 - Original

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: B3.09924F Amount analyzed: 8.750e+01 GDRY

Client sample ID: F4.4-I4.4 Preparation batch #: 0010500M Matrix: SOIL Assay batch #: 0017548V

Collected: 2011-11-29 15:45 CST Prep procedure: N/A

Sample type: SAM Analysis method: NAREL GAM-01

Dry/wet weight: 77.47 % Analyst: MO Ash/dry weight: N/A QC type: ANA

Sample description: N/AComment: N/A

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator	
11/15/2013 09:48	300.0	GE14	MO	

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	3.07e+00	6.4e-01	5.6e-01	PCI/GDRY	11/29/2011 15:45 CST
Bi214	J	2.81e+00	3.2e-01	7.7e-02	PCI/GDRY	11/29/2011 15:45 CST
K40		1.01e+01	1.2e+00	4.0e-01	PCI/GDRY	11/29/2011 15:45 CST
Pb212	J	2.25e+00	2.6e-01	9.4e-02	PCI/GDRY	11/29/2011 15:45 CST
Pb214	J	3.46e+00	3.9e-01	8.1e-02	PCI/GDRY	11/29/2011 15:45 CST
Ra228		2.60e+00	3.3e-01	1.5e-01	PCI/GDRY	11/29/2011 15:45 CST
Th234	J	1.67e+00	9.5e-01	1.4e+00	PCI/GDRY	11/29/2011 15:45 CST
T1208	J	7.49e-01	9.5e-02	4.7e-02	PCI/GDRY	11/29/2011 15:45 CST
U235	J	2.21e-01	1.7e-01	2.8e-01	PCI/GDRY	11/29/2011 15:45 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: B3.09924F Amount analyzed: 8.750e+01 GDRY

Client sample ID: F4.4-I4.4 Preparation batch #: 0010500M Matrix: SOIL Assay batch #: 0017548V

Collected: 2011-11-29 15:45 CST Prep procedure: N/A

Sample type: SAM Analysis method: NAREL GAM-01

Dry/wet weight: 77.47 % Analyst: MO Ash/dry weight: N/A QC type: DUP

 $\begin{array}{ll} \text{Sample description:} & N/A \\ \text{Comment:} & N/A \end{array}$

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/15/2013 15:54	1000.0	GE03	MO

ANALYTICAL RESULTS

		± 2 σ			
Analyte	Activity	Uncertainty	MDC	Unit	Reference Date
Bi212 J	2.84e+00	4.9e-01	4.1e-01	PCI/GDRY	11/29/2011 15:45 CST
Bi214 J	2.92e+00	3.2e-01	5.0e-02	PCI/GDRY	11/29/2011 15:45 CST
K40	1.00e+01	1.2e+00	3.2e-01	PCI/GDRY	11/29/2011 15:45 CST
Pb212 J	2.38e+00	2.7e-01	5.8e-02	PCI/GDRY	11/29/2011 15:45 CST
Pb214 J	3.49e+00	3.8e-01	5.6e-02	PCI/GDRY	11/29/2011 15:45 CST
Ra228	2.81e+00	3.3e-01	1.1e-01	PCI/GDRY	11/29/2011 15:45 CST
Th234 J	2.51e+00	9.2e-01	1.3e+00	PCI/GDRY	11/29/2011 15:45 CST
T1208 J	8.01e-01	9.3e-02	3.2e-02	PCI/GDRY	11/29/2011 15:45 CST
U235 J	1.25e-01	9.6e-02	1.6e-01	PCI/GDRY	11/29/2011 15:45 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: B3.09925G Amount analyzed: 8.790e+01 GDRY

Client sample ID: I1.9 Preparation batch #: 0010500M Matrix: SOIL Assay batch #: 0017548V

Collected: 2011-12-05 15:10 CST Prep procedure: N/A

Sample type: SAM Analysis method: NAREL GAM-01

Dry/wet weight: 82.38 % Analyst: MO Ash/dry weight: N/A QC type: ANA

Sample description: N/A Comment: N/A

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator	
11/15/2013 14:50	300.0	GE14	MO	l

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	3.08e+00	5.8e-01	5.2e-01	PCI/GDRY	12/05/2011 15:10 CST
Bi214	J	1.31e+00	1.6e-01	6.7e-02	PCI/GDRY	12/05/2011 15:10 CST
K40		1.17e+01	1.4e+00	3.6e-01	PCI/GDRY	12/05/2011 15:10 CST
Pb212	J	2.59e+00	3.0e-01	1.0e-01	PCI/GDRY	12/05/2011 15:10 CST
Pb214	J	1.61e+00	2.0e-01	8.0e-02	PCI/GDRY	12/05/2011 15:10 CST
Ra228		3.26e+00	3.9e-01	1.7e-01	PCI/GDRY	12/05/2011 15:10 CST
Th234	J	1.20e+00	8.4e-01	1.2e+00	PCI/GDRY	12/05/2011 15:10 CST
T1208	J	8.29e-01	1.0e-01	4.8e-02	PCI/GDRY	12/05/2011 15:10 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: B3.09926H Amount analyzed: 9.520e+01 GDRY

Client sample ID: D1/E1-D2/E2 Preparation batch #: 0010500M Matrix: SOIL Assay batch #: 0017548V

Collected: 2011-12-05 15:25 CST Prep procedure: N/A

Sample type: SAM Analysis method: NAREL GAM-01

Dry/wet weight: 83.23 % Analyst: MO Ash/dry weight: N/A QC type: ANA

Sample description: N/A Comment: N/A

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator	
11/15/2013 19:52	300.0	GE14	MO	

ANALYTICAL RESULTS

		± 2 σ			
Analyte	Activity	Uncertainty	MDC	Unit	Reference Date
Bi212 J	2.43e+00	5.4e-01	4.9e-01	PCI/GDRY	12/05/2011 15:25 CST
Bi214 J	2.00e+00	2.3e-01	7.3e-02	PCI/GDRY	12/05/2011 15:25 CST
K40	1.13e+01	1.3e+00	3.6e-01	PCI/GDRY	12/05/2011 15:25 CST
Pb212 J	2.06e+00	2.4e-01	9.3e-02	PCI/GDRY	12/05/2011 15:25 CST
Pb214 J	2.60e+00	3.0e-01	7.9e-02	PCI/GDRY	12/05/2011 15:25 CST
Ra228	2.16e+00	2.8e-01	1.5e-01	PCI/GDRY	12/05/2011 15:25 CST
Th234 J	1.86e+00	8.6e-01	1.2e+00	PCI/GDRY	12/05/2011 15:25 CST
T1208 J	6.66e-01	8.8e-02	4.8e-02	PCI/GDRY	12/05/2011 15:25 CST
U235 J	1.67e-01	1.6e-01	2.6e-01	PCI/GDRY	12/05/2011 15:25 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: B3.09927J Amount analyzed: 1.359e+02 GDRY

Client sample ID: A.2/A.3-B.2/B.3 Preparation batch #: 0010500M Matrix: SOIL Assay batch #: 0017548V

Collected: 2011-12-06 15:00 CST Prep procedure: N/A

Sample type: SAM Analysis method: NAREL GAM-01

Dry/wet weight: 88.49 % Analyst: MO Ash/dry weight: N/A QC type: ANA

Sample description: N/A Comment: N/A

COUNTING INFORMATION

Date and time	Date and time Duration (min)		Operator
11/16/2013 00:55	300.0	GE14	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi212	J	2.02e+00	4.3e-01	4.0e-01	PCI/GDRY	12/06/2011 15:00 CST
Bi214	J	1.04e+00	1.3e-01	5.3e-02	PCI/GDRY	12/06/2011 15:00 CST
K40		1.13e+01	1.3e+00	2.8e-01	PCI/GDRY	12/06/2011 15:00 CST
Pb212	J	1.48e+00	1.7e-01	6.9e-02	PCI/GDRY	12/06/2011 15:00 CST
Pb214	J	1.25e+00	1.5e-01	6.2e-02	PCI/GDRY	12/06/2011 15:00 CST
Ra228		1.86e+00	2.3e-01	1.1e-01	PCI/GDRY	12/06/2011 15:00 CST
Th234	J	6.59e-01	6.5e-01	9.8e-01	PCI/GDRY	12/06/2011 15:00 CST
T1208	J	5.25e-01	6.8e-02	3.4e-02	PCI/GDRY	12/06/2011 15:00 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: LCS-00678726W Amount analyzed: 1.000e+00 SAMP Client sample ID: N/A Preparation batch #: 0010500M Matrix: N/A Assay batch #: 0017548V Collected: N/A Prep procedure: N/A

 $Sample \ type: \qquad N/A \qquad \qquad Analysis \ method: \qquad NAREL \ GAM-01$

Dry/wet weight: N/A Analyst: MO Ash/dry weight: N/A QC type: LCS

Sample description: N/A Comment: N/A

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/16/2013 05:58	300.0	GE14	MO

ANALYTICAL RESULTS

Analyte		Activity	± 2 σ Uncertainty	MDC	Unit	Reference Date
Bi207		2.42e+03	2.7e+02	5.6e+01	PCI	12/15/2010 11:00 CST
Bi214	J	3.75e+01	8.3e+00	9.2e+00	PCI	12/15/2010 11:00 CST
Eu155		6.06e+02	7.1e+01	2.7e+01	PCI	12/15/2010 11:00 CST
K40		8.28e+01	3.9e+01	4.4e+01	PCI	12/15/2010 11:00 CST
Pb212	J	6.65e+01	1.2e+01	1.2e+01	PCI	12/15/2010 11:00 CST
Pb214	J	4.67e+01	1.1e+01	1.3e+01	PCI	12/15/2010 11:00 CST
Ra228		7.54e+01	1.8e+01	2.7e+01	PCI	12/15/2010 11:00 CST
T1208 J		2.17e+01	6.2e+00	7.1e+00	PCI	12/15/2010 11:00 CST

SDG #1300082

SAMPLE ANALYSIS REPORT

Lab sample #: RBK-00678727X 1.000e+00 SAMP Amount analyzed: Client sample ID: Preparation batch #: 0010500M N/A Matrix: Assay batch #: 0017548V N/A Collected: Prep procedure: N/A N/A N/A NAREL GAM-01

Sample type: Analysis method:

Analyst: Dry/wet weight: N/AMO Ash/dry weight: N/A QC type: **RBK**

Sample description: N/A Comment: N/A

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/16/2013 11:00	300.0	GE14	MO

ANALYTICAL RESULTS

			± 2 σ			
Analyte		Activity	Uncertainty	MDC	Unit	Reference Date
Bi212	J	7.83e-01	1.8e+01	3.1e+01	PCI	11/15/2013 07:00 CST
Bi214	J	5.12e+00	3.8e+00	5.0e+00	PCI	11/15/2013 07:00 CST
K40		-1.56e+00	1.5e+01	2.7e+01	PCI	11/15/2013 07:00 CST
Pb212	J	2.71e+00	2.3e+00	3.5e+00	PCI	11/15/2013 07:00 CST
Pb214	J	4.63e+00	3.3e+00	5.4e+00 PCI		11/15/2013 07:00 CST
Ra228		4.32e-01	4.7e+00	8.8e+00	PCI	11/15/2013 07:00 CST
T1208 J		2.48e+00	1.5e+00	2.1e+00	PCI	11/15/2013 07:00 CST

SDG 1300082

PREPARATION BATCH SUMMARY

Preparation batch #: 0010500M Analysis method: NAREL GAM-01

Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	±2 σ Uncertainty	Analyst
B3.09924F	F4.4-I4.4	00674975V		N/A		MO
B3.09924F	F4.4-I4.4	00678725V	DUP	N/A		MO
B3.09925G	I1.9	00674976W		N/A		MO
В3.09926Н	D1/E1-D2/E2	00674977X		N/A		MO
B3.09927J	A.2/A.3-B.2/B.3	00674978Y		N/A		MO
LCS-00678726W *		00678726W	LCS	N/A		MO
RBK-00678727X *		00678727X	RBK	N/A		MO

^{*} Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0010500M

		QC					
NAREL Sample #	Analysis #	Type	Analyte	%R	RPD	Z	Evaluation
B3.09924F	00678725V	DUP	BI212		7.9	-0.58	PASS-J
B3.09924F	00678725V	DUP	BI214		4.0	0.50	PASS-J
B3.09924F	00678725V	DUP	K40		0.8	-0.09	PASS
B3.09924F	00678725V	DUP	PB212		5.4	0.67	PASS-J
B3.09924F	00678725V	DUP	PB214		0.6	0.08	PASS-J
B3.09924F	00678725V	DUP	RA228		7.9	0.92	PASS
B3.09924F	00678725V	DUP	TH234		40.3	1.28	PASS-J
B3.09924F	00678725V	DUP	TL208		6.8	0.79	PASS-J
B3.09924F	00678725V	DUP	U235		55.4	-0.98	PASS-J
LCS-00678726W	00678726W	LCS	BI207	86.4		-2.61	WARN
LCS-00678726W	00678726W	LCS	EU155	99.7		-0.05	PASS
RBK-00678727X	00678727X	RBK	BI212				PASS-J
RBK-00678727X	00678727X	RBK	BI214				WARN-J
RBK-00678727X	00678727X	RBK	K40				PASS
RBK-00678727X	00678727X	RBK	PB212				WARN-J
RBK-00678727X	00678727X	RBK	PB214				WARN-J
RBK-00678727X	00678727X	RBK	RA228				PASS
RBK-00678727X	00678727X	RBK	TL208				HIGH-J

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.

Appendix F

Shipping Manifests

		¢]/	10021	1140	VZ.							
1		ION-HAZARDOUS VASTE MANIFEST	Generator ID Number	NA		2. Page 1 of		ncy Respons	e Phone -\75 J		racking Nu	mber	-01	
**************************************	5. Ge	enerator's Name and Ma Clated BI 50 West Hy Claude	iling Address F 500 Lake: Nobord 50 te FL 6060; The 377 883	Shire own	ier, LLC	•	55	Nort	n Posh	han mailing addi Litigo Co 6060	vit			
	Gene 6. Tra	ansporter 1 Company N	Ranger	***************************************					1 .4	U.S. EPA ID Number FLR 000067157				
	7. Tra	ansporter 2 Company Na	ame							U.S. EPA ID				
	8. De	signated Facility Name: USEU 2040	and Sile Address Play y Flah (Lenky Road	I. Inc.						U.S. EPA ID Number				
	Facilit	ty's Phone:) 08	gnated racing Name and Sile Address US Edlog y Idaho, Inc. 20400 Lenky Road Erndrien, ID 83624 's Phone: 108-934-2275								007	31146	54	
	9. Waste Shipping Name and Description						10. Cont No.	ainers Type	11, Total Quantity	12. Unit WL/Vol.				
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		3.												
		4.												
	13. S	pecial Handling Instruct	ions and Additional Information	วก							1			
		WS#	26883-0											
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	marke	d and labeled/placarded	R'S CERTIFICATION: I here I, and are in all respects in pr	by declare that the coper condition for the	contents of this co ansport according	g to applicabl	e internation	ccurately des al and govern	scribed above mental regula	by the proper sh itions.	ipping name			
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3L ITY	17b. A	temate Facility (or Gene	erator)						····	U.S. EPA ID	Number		1,	
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169	<u> </u>	Typed Name DDWWW 0 6 10498 (Rev	Pullen	for 1	1967	- Sig	nature	bn	Ma	PUL ESIGNATI	LLIN ED FAC	Month JO	Day Year 34 // SENERATOR	

CERTIFICATE OF DISPOSAL

November 01,2011

RELATED BIT 500 LAKE SHORE OWNER, LLC 515 B PESHTIGO CT CHICAGO, IL 60601

This is to certify that waste as defined on Waste Manifest number <u>01/</u> was received by U.S. Ecology, Inc., on <u>10/24/2011</u>. The waste(s) were subsequently treated, if required by 40 CFR Part 268 and U.S. Ecology's permits and disposed of by <u>10/24/2011</u> in accordance with permits and laws regulating this facility.

Reference Number: 11102414006-01-1-1

Material: 1 FLAT BED

Process: Direct Landfill

Management Code:

Facility: U.S. ECOLOGY IDAHO, INC.

20400 LEMLEY ROAD GRAND VIEW, ID 83624 EPA ID: IDD073114654

Waste Type: NON HAZARDOUS WASTE

Customer: ICE SERVICE GROUP

Printed Name: DONNA PULLEN

Signature: Donna Pullen

Title: RECEIVING SUPERVISOR

			1116	341400	08								
1	V	NON-HAZARDOUS		NIA	1	172	jency Response くく - ろりる	Phone		racking Nu	mber	-07	
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	Gen	erator's Phone: 312	-337-88	31			hicago	, 1	- D (
		Londstar	Ranger						FL	<u>R00</u>	0067	57	
	7. Tr	ansporter 2 Company Nam	: €						U.S. EPA ID	Number			
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	_		Operator: Certification of re	celpt of materials covered by	the manifest excep	ot as noted i	n Item 17a						**
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CERTIFICATE OF DISPOSAL

November 01,2011

RELATED BIT 500 LAKE SHORE OWNER, LLC 515 B PESHTIGO CT CHICAGO, IL 60601

This is to certify that waste as defined on Waste Manifest number <u>02/</u> was received by U.S. Ecology, Inc., on <u>10/24/2011</u>. The waste(s) were subsequently treated, if required by 40 CFR Part 268 and U.S. Ecology's permits and disposed of by <u>10/24/2011</u> in accordance with permits and laws regulating this facility.

Reference Number: 11102414008-02-1-1

Material: 1 FLAT BED

Process: Direct Landfill

Management Code:

Facility: U.S. ECOLOGY IDAHO, INC.

20400 LEMLEY ROAD GRAND VIEW, ID 83624 EPA ID: IDD073114654

Waste Type: NON HAZARDOUS WASTE

Customer: ICE SERVICE GROUP

Printed Name: DONNA PULLEN

Signature: Donna Pullen

Title: RECEIVING SUPERVISOR

7	NON-HAZABDEUS" WASTE MANIFEST	1. Generator ID Number	1	3. Emergency Responsi	2-1752		acking Numbe	r	-0	3
100	5. Generator's Name and Mailin Related B	17 500 Lake Sh Hubbard Svite 3 IL 60601	ore Owner, Ll	Generator's Site Addres		mailing addre	ss)	\		
80000	350 West Chicago,	Hubbard, Svite 3	<i>٥</i> ٥ ′	512 /	190, I		-			
5.65	Generator's Phone: 3 6. Transporter 1 Company Nam	12-351-8851			10, -	U.S. EPA ID N	lumber			
No.	Lawst	ar kanger				F L	2000	067	157	
	7. Transporter 2 Company Nam				1	0.5. EFA 10 1	wmper			
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3.11	20400 L	d Sile Address gy Toaho, Inc. enter Ko v. ID 83624	208-834-7)) 7で 。	,	71	2007	フェレ	165	u
	9. Waste Shipping Name		0 001 0	10. Conta	т	11. Total	12. Unit	711	• • •	
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200	3.	.*						0.00		
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								Section 2		
	13. Special Handling Instruction	ns and Additional Information			<u> </u>					12.00 × 5
	WS #	26883-0								
									2	
	14. GENERATOR'S/OFFEROR'	S CERTIFICATION: I hereby declare that the	contents of this consignment ar	e fully and accurately des	scribed above by	the proper ship	ping name, an	d are classifie	id. package	d
	marked and labeled/placarded, a Generator's/Offeror's Printed/Typ	and are in all respects in proper condition for t	ransport according to applicable	international and govern	nmental regulation	ns.		Month	Day	Year
<u> </u>	15. International Shipments		d Lease	flet.				10	S 0	//
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DESIGNATED								1		22. 8. 7 8.
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	18. Designated Facility Owner or	Operator: Certification of receipt of materials			/ 1		and the second second second second	Month	Date	Vear
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CERTIFICATE OF DISPOSAL

November 01,2011

RELATED BIT 500 LAKE SHORE OWNER, LLC 515 B PESHTIGO CT CHICAGO, IL 60601

This is to certify that waste as defined on Waste Manifest number <u>03/</u> was received by U.S. Ecology, Inc., on <u>10/25/2011</u>. The waste(s) were subsequently treated, if required by 40 CFR Part 268 and U.S. Ecology's permits and disposed of by <u>10/25/2011</u> in accordance with permits and laws regulating this facility.

Reference Number: 11102514089-03-1-1

Material: 1 FLAT BED

Process: Direct Landfill

Management Code:

Facility: U.S. ECOLOGY IDAHO, INC.

20400 LEMLEY ROAD GRAND VIEW, ID 83624 EPA ID: IDD073114654

Waste Type: NON HAZARDOUS WASTE

Customer: ICE SERVICE GROUP

Printed Name: DONNA PULLEN

Signature: Donna Pullen

Title: RECEIVING SUPERVISOR

	11102414	012
4	S Consented to the plant	age 1 of 3. Emergency Response Phone 1. 72 4 - 312 - 1252 Generator's Site Address (if different than mailing address)
	5. Generator's Name and Mailing Address Related BIT 500 Lake Share Own 350 west Hubbard Soite 300 Chicago, IL 60601 312-337-88	Generator's Site Address (if different than mailing address) -C, LLC 515 North PEShtigo Ct.
	6 Transporter 1 Company Name	11.9 EPA IO Mumber
	Southurn Pines Tucking 7. Transporter 2 Company Name	U.S. EPA ID Number
	8. Designated Facility Name and Site Address US ECOLOGY TO COLOR 20400 Lonley RO. Facility's Phone: Godd'in, ID 83624	U.S. EPA ID Number 100 8345) 75 ID 0073114654
	Facility's Phone: Grady it 18 83624 9. Waste Shipping Name and Description	208-834-2275
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NERATO	DOT NON-Regulated Non-hazarda	ss soil T BA T
 -	2.	
	3.	
	4.	
,	13. Special Handling Instructions and Additional Information Wら 井 2も883~0	
	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consigner marked and labeled/placarded, and are in all respects in proper condition for transport according to a	nment are fully and accurately described above by the proper shipping name, and are classified, packaged, applicable international and governmental regulations.
V	Generator's/Offeror's Printed/Typed Name SASON SAMOLINSKI Lend Leas.	Signature Month Day Year / /o 20 / /
INT.L	15. International Shipments Import to U.S. Expo	on from U.S. Port of entry/exit:
RTER	16. Transporter Acknowledgment of Receipt of Materials Transporter 1 Printed/Typed Name	Signapore A A A C M C Month Day Year
TRANSPORTER INT	Daniel Mc Gaire Transporter 2 Printed/Typed Name	
¥ H	17. Discrepancy	
	17a. Discrepancy Indication Space Sec. 65 PATO # 100 DD 73114654 Type 17a. November 100 DD 73114654 Type Type Type Type Type Type Type	Residue Parlial Rejection Full Rejection
- LI	MINTO Nelelised Beneling Cusplulier 176. Alternate Facility (or Generator)	Manifest Reference Number: U.S. EPA ID Number
D FACIL	Facility's Phone: 17c. Signature of Alternate Facility (or Generator)	Month Day Year
DESIGNATED FACILITY	170. Signature of America Facility (of Constation)	
- DES		
	18 Designated Facility Owner or Operator: Certification of receipt of glaterials covered by the manifes	st except as noted in item 17a Signature Month Day Year
*	YVHUU JUUNUCHUNET	1 XXXIII MUCHUL 100411

CERTIFICATE OF DISPOSAL

November 01,2011

RELATED BIT 500 LAKE SHORE OWNER, LLC 515 B PESHTIGO CT CHICAGO, IL 60601

This is to certify that waste as defined on Waste Manifest number <u>04/</u> was received by U.S. Ecology, Inc., on <u>10/24/2011</u>. The waste(s) were subsequently treated, if required by 40 CFR Part 268 and U.S. Ecology's permits and disposed of by <u>10/24/2011</u> in accordance with permits and laws regulating this facility.

Reference Number: 11102414012-04-1-1

Material: 1 FLAT BED

Process: Direct Landfill

Management Code:

Facility: U.S. ECOLOGY IDAHO, INC.

20400 LEMLEY ROAD GRAND VIEW, ID 83624 EPA ID: IDD073114654

Waste Type: NON HAZARDOUS WASTE

Customer: ICE SERVICE GROUP

Printed Name: DONNA PULLEN

Signature: Donna Pullen

Title: RECEIVING SUPERVISOR

120/0300040 SAPODA 14.5T

1		NON-HAZARDOUS 1. Generator ID Number V A	2. Page 1 of	3. Emergency Resp. 724-312	-175)		Fracking Nun	nber	-05
	5.	Generator's Name and Mailing Address Related BIT 500 Lake Sture Owner, LLC 350 West Humberd Suite 3-10			North	Prsht:	igo C		
	Ge	Related BIT 500 Lake Store Owner, LLC 350 vost Husbard & vite 300 Chicago, IL 60 koi eneralor's Phone: 312 - 337 - 8831		Ch	icago,	TL		060	
	6.	Transporter 1 Company Name Lond Star Ranger			*		LROC	00067	<i>15</i> 7
	7.	Transporter 2 Company Name				U.S. EPA ID	Number		,
	8.	Designated Facility Name and Site Address US ELONGRY I days	The	ş		U.S. EPA ID) Number		
	Fai	20400 Lenky Rd.	38	624		1I.	D00°	731146	54
		9. Waste Shipping Name and Description		10. C No.	onlainers Type	11. Total Quantity	12. Unit Wt./Vol.		
GENERATOR -		DOT Non-Regulated, Non-Hazardas	< 50	105	BA	2/	Т		
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200		3.							
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	13.	Special Handling Instructions and Additional Information							
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2013125									
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¥	(nerstor's/Offeror's Printed/Typed Name Jason Samolins/4: Lend Leas	e si	nature >			*************	/2	Day Year 30 1 1
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ORTER	E	Transporter Acknowledgment of Recoipt of Materials nsporter 1 Printed/Typed Name	Sig	nature) N	, <u> </u>			Month	Day Year
TRANSPORT	Tran	N - PUNT nsporter 2 Printed/Typed Name	Sig	nature	ne _			Month	Day Year
F.		Discrepancy		6 2.					
The Control of the Co	17a AC	Discrepancy Indication Space, Quantity Weight of Type awar received of Sounding Weight of Type	Mark	Delfrai	te siu	Partial Re	ejection UNSW	-1-5-12	ll Rejection
λL	17b.	NM Sulliver funding subdutting. Atternate Facility (or Generator)		Manifest Referen	ce Number.	U.S. EPA ID	Number		
) FACIL		ility's Phone:						D1	
DESIGNATED FACILITY	1/C.	Signature of Alternate Facility (or Generator)	1.			SS., SS. VS. 11 . 12 . 17 .		Month	Day Year
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		Designated Facility Oyans or Operator. Certification of receipt of materials covered by the materials and the materials of th		as noted in Item 17a		1/1/1	1. 1	Mealh /)3/2/2°5
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25,960# SPRT SPR

4	7	NON-HAZARDOUS	Generator ID Number	A	2. Page 1 of	4	ency Response			racking Number	1/	./
¥ T	1	WASTE MANIFEST	N	A		72	<u>4-312-</u>	1752			<u> </u>	06
	5.0	Generator's Name and Mailir	ng Address	Acres of 180			's Site Address	•	•		V	
		Links DT	topped city	normani , ccc	•	-	15 Na		44	-		2
1	Ge	nerator's Phone:	10 IIL 60601	nordwart, LLC 300 312-337-88	31 1	C	hi (ag	10, I	6	0 601 Number		
								'	U.S. EPA ID	Number		
1	L	BEEL	MAN /	Ruck-CO	,					92//5	5200	5//
	7. 1	fransporter 2 Company Nam	ie .						U.S. EPÁ ID	Number		
T-September 1	8. 8	Designated Facility Name an	d Sile Address (): Fr	-1					U.S. EPA ID	Number		
			10 V	ology Idaho, 7	アゾC・	•			0.0			
1			20 90	so remary tro	0 7/0				T1	N	> i / .	~ 1
100	Fac	ility's Phone: 308 -83	1-1275 Gent	View, ID	<u> </u>	<u>ly</u>			ナト	D0073	51140	> 4
1		9. Waste Shipping Name	and Description			-	10. Conta No.	Type	11. Total Quantity	12, Unit Wt./Vol.		
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		1.10	# 2688	2 . 2								
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	mar	ked and labeled/placarded, a	and are in all respects in prop	er condition for transport according	g to applicable	internation				77773		
$ \downarrow $	Gen	erator's/Offeror's Printed/Tyr	ned Name	Lend Lease		nature	28			e.	Month Day	55
ا اب	15.	nternational Shipments		pora Des		10		4. 4. 24.		V. Ogl	107 103	
₹		sporter Signature (for expor	LI Import to U.S. ts only);		Export from U	v.S.	Port of en Date leavi	•				
띮		rensporter Acknowledgmen			:						· · · · · · · · · · · · · · · · · · ·	
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	Ç,		he Liseall	Should be 97	T and	180T.	gasn	maric	Della	£ 1/9/12	r	
ا ا	17b.	C 10 Sh nulcl Alternate Facility (or Genera		STIVILED CO.		manne	St. Hererence N	lumber:	U.S. EPA ID	Number		
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		ity's Phone:		<u> </u>							Manu B	
ATE	176.	Signature of Allemate Facilit	ry (or Generator)		1						Month Day	Year 1
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1 L	_M		Operator: Certification of rece	ipt of materials covered by the m	anifest except	as, noted in	ltem 17a	(31)	·····		Mant. C	
V	T ^{nte}	ed/TypestName	MICHAIL	11 tolus		26	1201	人 動物	flor	M		7/5
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			The state of the s		d Language	ملكات ن	E new	En Sur.				

5 bags 2010900441 1. Generator ID Number NON-HAZARDOUS NIA -07 724-312-1752 WASTE MANIFEST 5. Generator's Name and Mailing Address Generator's Site Address (if different than mailing address) RUNTED BIT 500 Lake Shore Owner, LLC 350 Vest Hubbard, 50 to 300 Chicago, IL 60601

Generalors Phone: 312 337-8831 515 North Peshtigo Ct. Chicago, IL 6. Transporter 1 Company Name FLR 000067 157 Landstar Kanger U.S. EPA ID Number 7. Transporter 2 Company Name 8. Designated Facility Name and Site Address U.S. EPA ID Number US Ecology Idaho, Inc. 20400 Lenley RO. IDD 0073114654 Grad View, ID 83624 10. Containers 11. Total 9. Waste Shipping Name and Description Wt/Vol. Quantity DOT Non-Regulated, Non-Hazardous Soil 13. Special Handling Instructions and Additional Information WS# 26883-0 14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and governmental regulations Month Day Year 05 15. International Shipments Date leaving U.S. Transporter Signature (for exports only): 16. Transporter Acknowledgment of Receipt of Materials Transporter 1 Printed/Typed Name Month LANDSTAR TERRY BURKE-01 05 17. Discrepancy 17a. Discrepancy Indication Space Quantity Type Partial Rejection Full Rejection Manifest Reference Number: U.S. EPA ID Number 17b. Alternate Facility (or Generator) Facility's Phone: 17c. Signature of Alternate Facility (or Generator) Month Year

(169-BLC-O 6 10498 (Rev. 9/09)

		12010	90044	3	270	25	5ba	90	
1	NON-HAZARDOUS 1. Generator ID Numb WASTE MANIFEST		2. Page 1 of 3. Emo	rgency Response	1752		racking Numb	er	-08
	5. Generator's Name and Mailing Address Refer to B'TT 500 350 West Hubbard Cuitage, Ti book Generator's Phone: 317-337-8 6. Transporter 1 Company Name	Lake Shure Owner, , Soite 300	LLC Genera	V	lortu l	an mailing addin ESHT g IL	o Ct.		
	6. Transporter 1 Company Name Lond Star 7. Transporter 2 Company Name	Ranger	-			U.S. EPA ID U.S. EPA ID	FLRC	00006	7157
	8. Designated Facility Name and Site Address US 20 Facility's Phone: 208 - 8-34 - 2275 G	Ecology Flah 400 Lentey Rd	0, Inc.	1		U.S. EPA ID		7311	1 YCA
	9. Waste Shipping Name and Description	iano view, Il	s sour	10. Conta	iners Type	11. Total Quantity	12, Unit Wt /Vol.	. 1 . 3 (163 1
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	4. 13. Special Handling Instructions and Additional Inform	sation							
	. Ws# 2.								
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¥	Generators/Offeror's Printed/Typed Name 450/ 15. International Shipments			250				Month	Day Year 06 /2
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TRANSPORTER	Transporter 1 Printed/Typed Name Transporter 2 Printed/Typed Name	DANIS	Signature Signature	Li	1	ph		Month Month	Day Year タイク Day Year
¥ E	17. Discrepancy								
	17a. Discrepancy Indication Space Quantity	LIType	Man	Residuc	tumber:	Partial Reju	ection	□F	ull Rejection
CILITY	17b. Allemate Facility (or Generator)					U.S. EPA ID I	Vumber		
DESIGNATED FACILITY	Facility's Phone: 17c. Signature of Alternate Facility (or Generator) .					<u> </u>		Month	Day Year
DESIG —				10 MEC.					
	18. Designated Facility Owner or Operator: Certification Printed/Typed Name	of receipt of materials covered by the	manifest except as noted Signature	in Item)17a	- -	sel.	5.11	Month	Day Year
\$	BI C-O 6 10498 (Bey 9/09)	T X/ JUNE		10000	ns programme	SIGNATE	DEACH	KY TO C	ENERATOR

169-BLC-O 6 10498 (Rev. 9/09)

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

DESIGNATED FACILITY TO GENERATOR

12011600539 M.710# 13.37T

	•	WASTE MANIFEST IN A	Ĭ	73	ency Response メージル	1757		racking Nu	mber	-lo
		200 Mest Hoppand Comp June Conver	LLC	51	5 North	in Pc	shtigo	Ct.		
		Generalor's Phone: 31 3 - 55 7 - 58 3			(W)	190,	IL	6	0601	
		6. Transponer 1 Company Name Saythen Pines Trucking					U.S. EPA ID		02	
		7. Transporter 2 Company Name			······································		U.S. EPA ID	Number		× × ×
		8. Designated Facility Name and Site Address US Ecology Idal 20400 Lembry RD Facility's Phone: 208-834-2275 Grand Vitw It	10, I	7C,	***************************************		U.S. EPA ID	Number		
		20400 Lemby RD	•	826) U		17 N	^ ^ ^	コン・・・・	./~u
		9. Waste Shipping Name and Description	<u> </u>	0 30	10. Conta	iners	11. Total	12. Unit	7311	1631
		6. Haste Suppling Frame and Description			No.	Туре	Quantity	Wt./Vol.		
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	VQ2 V2.000	\$35 4.							1200	X 45 - 04 - 04
	5 C. C. C. C. C.									
		13. Special Handing Instructions and Additional Information			and the second of the second of the second					
		105 # 26883-0.								
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**************************************	ľ	Generator's Offeror's Printed Typod Name 15. International Shipments Import to U.S. From the Control of th	Sìgn کیکے ا صت	nature	-				Month (O/	Day Year
INT	1	15. International Shipments Import to U.S. Ex	port from U	I.S.	Port of ent	•			***************************************	
œ	1	16. Transporter Acknowledgment of Receipt of Materials Transporter 1 Printed/Typed Name	Sign	natione	Date learn	ng 0.0			Month	Day Year
THANSPORTE		SOUTHERN PINES TRUCKING		Jen i	Show.	£				le 12
THAN		Transporter 2 Printed/Typed Name	Sign	nature					Month	Day Year
1	١	17. Discrepancy 17a. Discrepancy Indication Space		, m	Daald	and the second s	Dowiel De			Full Rejection
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) FACILITY		Facility's Phone:	*****							
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	1/	6. Dysignator, Facility Owno or Operator-Certification of receipt of materials covered by the man	fest exceo⊓	as poted in	Item,1 Av	//				
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Appendix G

Equipment Release Survey Results

ATTACHMENT 1

RADIATION SURVEY FORM

SURVEY REFERENCE #: 91411-01

DATE OF SURVEY: September 14, 2011

NAME OF SURVEYOR: Glenn Huber

SURVEY METER IDENTIFICATION: Mfg: Ludlum

Background Reading: 60 cpm Model: 14C

Serial: 114750

INSTRUMENT ID: Mfg: Ludlum

Background Reading: 0.47 cpm Model: 2200 (scaler) / 43-10 (alpha)

Efficiency: 23.9% Serial: 102770 / PR113195

MDA: 12.56 dpm

Description (attached sketch if needed)	Item	Survey	Wipe Gross	dom ner
	#	-	-	
(Area, equipment, vehicle, materials, etc.)	#	cpm	cpm	100 sq. cm
Backhoe			2min ct Gross C	PM
Left Tread	1	<100	2 1	<13
Right Tread	2	<100	0 0	<13
Inside Bucket	3	<100	3 1.	.5 <13
Outside Bucket	4	<100	3 1.	.5 <13

Appendix H

Air Monitoring Results

H-1 Perimeter Air Monitoring

H-2 Personal Air Monitoring

Appendix H-1

Perimeter Air Monitoring

Area Air Monitoring Summary Sheet - Staplex High Volume Pumps (Daily Analysis) 515 Peshtigo Ct., Chicago, IL AECOM

Report No. 1 Monday September 12, 2011 - Wednesday September 14, 2011

		total	cubic	sample			day	after an	alysis					fou	r day ar	nalysis			% of Limit
Sample	date	time	ft/ min	volume	date	gross	gross	bkg	net		Concentration	date	gross	gross	bkg	net		Concentration	4.00E-15
ID	sampled	sampled	(CFM)	analyzed	analyzed	counts	cpm	cpm	cpm	eff	in uCi/ml	analyzed	counts	cpm	cpm	cpm	eff	in uCi/ml	Th-232 uCi/ml
S001	9/12/11	195	45	8.70E+06								09/16/11	15	0.50	0.47	0.03	0.239	1.86E-15	46.44%
W001	9/12/11	195	47	9.08E+06	No	Day Af	ter Anal	ysis Per	formed -	4 Day	Only	09/16/11	12	0.40	0.47	0.00	0.239	0.00E+00	0.00%
S002	9/13/11	305	46	1.39E+07								09/19/11	11	0.37	0.43	0.00	0.239	0.00E+00	0.00%
W002	9/13/11	305	42	1.27E+07								09/19/11	14	0.47	0.43	0.04	0.239	1.56E-15	38.88%
S003	9/14/11	195	50	9.66E+06								09/19/11	12	0.40	0.43	0.00	0.239	0.00E+00	0.00%
W003	9/14/11	195	49	9.47E+06								09/19/11	10	0.33	0.43	0.00	0.239	0.00E+00	0.00%
																			!

Area Air Monitoring Summary Sheet - Weekly Effluent Concentration Report

515 Peshtigo Ct. - AECOM

South Monitor (High Volume) Report #1 9/12/11 - 9/16/11

		•		, ,
	Time Sampled	Effluent Concentration	Concentration x	
Date	(minutes)	in uCi/ml	Sample Min / Day	Comments
9/12/2011	195	1.86E-15	3.63E-13	
9/13/2011	305	0.00E+00	0.00E+00	
9/14/2011	195	0.00E+00	0.00E+00	
9/15/2011	0	0.00E+00	0.00E+00	No Excavation Today
9/16/2011	0	0.00E+00	0.00E+00	No Work Today
	695	1.86E-15	3.63E-13	

 $C_{avg} = \Sigma T_{s,i} C_{i}$ $\Sigma \mathsf{T_s}$ Time Weighted Weekly

Effluent Concentration (North) = 5.22E-16 uCi/ml

Eq A.9 NUREG 1400

Percentage of Release Limit of = 13.05% 4E-15uCi/ml Th-232

West Monitor

	Time Sampled	Effluent Concentration	Concentration x	
Date	(minutes)	in uCi/ml	Sample Min / Day	Comments
9/12/2011	195	0.00E+00	0.00E+00	
9/13/2011	305	1.56E-15	4.76E-13	
9/14/2011	195	0.00E+00	0.00E+00	
9/15/2011	0	0.00E+00	0.00E+00	No Excavation Today
9/16/2011	0	0.00E+00	0.00E+00	No Work Today
-	695	1.56E-15	4.76E-13	

 $C_{avg} = \Sigma T_{s,i} C_i$

Eq A.9 NUREG 1400

Time Weighted Weekly Effluent Concentration (South) = 6.85E-16 uCi/ml

Percentage of Release Limit of =

17.12%

4E-15uCi/ml Th-232

Area Air Monitoring Summary Sheet - Staplex High Volume Pumps (Daily Analysis) 515 Peshtigo Ct., Chicago, IL AECOM

Report No. 2 Monday November 21, 2011 - Tuesday December 6, 2011

		total	cubic	sample			day	after an	alysis					fou	r day aı	nalysis			% of Limit
Sample	date	time	ft/ min	volume	date	gross	gross	bkg	net		Concentration	date	gross	gross	bkg	net		Concentration	4.00E-15
ID	sampled	sampled	(CFM)	analyzed	analyzed	counts	cpm	cpm	cpm	eff	in uCi/ml	analyzed	counts	cpm	cpm	cpm	eff	in uCi/ml	Th-232 uCi/m
No High	Volume A	ir Sample	es on 11/2	21/11 or															
11/29/11	Due to Ra	ain																	
S004	12/2/11	390	45	1.74E+07								12/06/11	13	0.43	0.43	0.00	0.239	1.03E-16	2.58%
W004	12/2/11	390	48	1.86E+07	No	Day Af	ter Analy	/sis Per	formed -	4 Day	Only	12/06/11	11	0.37	0.43	0.00	0.239	0.00E+00	0.00%
S005	12/5/11			4.46E+06								12/09/11	7		0.5		0.239		
W005	12/5/11	75	57	4.24E+06								12/09/11	12	0.40	0.5	0.00	0.239	0.00E+00	0.00%
0000	40/0/44	000	50	4.455.07								40/40/44	40	0.40	0.47	0.00	0.000	0.005.00	0.000/
S006	12/6/11			1.15E+07								12/12/11	12	0.40	0.47		0.239		
W006	12/6/11	200	55	1.09E+07								12/12/11	13	0.43	0.47	0.00	0.239	0.00E+00	0.00%

Appendix H-2

Personal Air Monitoring

Personal Air Monitoring Summary Sheet (PAM's -Daily Analysis) Report No. 1 September 12, 2011 - September 14, 2011 AECOM 515 Peshtigo Ct. - Chicago, IL

								day	y after a	nalysis					four	day an	alysis		
			Flow	Total	Total		Gross					Sample		Gross					Sample
Date		Sample	Rate	Time	Sample	Analysis	Counts	Gross	Bkg	Net		Concentration	Analysis	Counts	Gross	Bkg	Net		Concentration
Collected	Init	ID	(lpm)	Sampled	Volume (ml)	Date	(30 min)	CPM	CPM	CPM	eff	(uCi/ml)	Date	(30 min)	CPM	CPM	CPM	eff	(uCi/ml)
9/14/11	GH	51501	2.5	785	1.96E+06	No day af	ter analy	sis -4 c	day only				09/19/11	9	0.30	0.43	0.00	0.239	0.00E+00
9/14/11	LL	51502	2.5	770	1.93E+06								09/19/11	12	0.40	0.43	0.00	0.239	0.00E+00
Sample 51	1501 (3. Huber	collect	ed over 3	excavation														
days 9/12/	′11 - 9	/14/11																	
9/12/11	10:30	am-3:10	pm = 2	80 min															
9/13/11	10:20	am-3:15	pm = 2	95 min															
9/14/11	8:05a	m-11:35	am = 2	10 min															
Sample 51	1502 L	Lach c	ollected	d over 3 ex	cavation														
days 9/12/	'11 - 9	/14/11																	
9/12/11	10:45	am-3:10	pm = 2	65 min															
9/13/11	10:20	am-3:15	pm = 2	95 min															
9/14/11	8:05a	m-11:35	am = 2	10 min															

^{***}Note: Samples are analyzed after 4 days to allow for radon / thoron progeny decay

Occupational Dose Limit for Occupational Radiation Exposure = 5 rem Total Effective Dose Equivalent 2000 DAC-Hours = 5 rem

DAC (Derived Air Concentration) for Th-232 = 5E-13uCi/ml

Administrative Site Limit for Occupational Exposure = 30% Th-232 DAC = 1.5E-13 uCi/ml

Personal Air Monitoring Summary Sheet (PAM's -Daily Analysis) Report No. 2 November 21, 2011 - December 6, 2011 AECOM 515 Peshtigo Ct. - Chicago, IL

							day after analysis						four day analysis								
			Flow	Total	Total		Gross					Sample		Gross					Sample		
Date		Sample	Rate	Time	Sample	Analysis	Counts	Gross	Bkg	Net		Concentration	Analysis	Counts	Gross	Bkg	Net		Concentration		
Collected	Init	ID	(lpm)	Sampled	Volume (ml)	Date	(30 min)	CPM	CPM	CPM	eff	(uCi/ml)	Date	(30 min)	CPM	CPM	CPM	eff	(uCi/ml)		
11/21/11	GH	51503	2.5	400	1.00E+06	No day af	ter analy	sis -4 c	day only				11/25/11	11	0.37	0.47	0.00	0.239	0.00E+00		
11/21/11	LL	51504	2.5	400	1.00E+06								11/25/11	8	0.27	0.47	0.00	0.239	0.00E+00		
12/2/11	GH	51505	2.5	670	1.68E+06								12/06/11	12	0.40	0.43	0.00	0.239	0.00E+00		
12/2/11	LL	51506	2.5	670	1.68E+06								12/06/11	10	0.33	0.43	0.00	0.239	0.00E+00		
12/6/11	GH	51507	2.5	315	7.88E+05								12/12/11	14	0.47	0.47	0.00	0.239	0.00E+00		
12/6/11	LL	51508	2.5	315	7.88E+05								12/12/11	11	0.37	0.47	0.00	0.239	0.00E+00		
days 11/29 11/29/11	9/11& 8:40a	12/2/11 m-2:10p	m = 33	0 min	excavation	Sample 5 days 11/2 11/29/11	1/11& 11 8:40am-	/28/11 2:10pm	= 330 m	in	avatior	n									
12/2/11	8:40a	ım-3:00p	m = 34	0 min		12/2/11	8:40am-	3:00pm	= 340 m	in											
Sample 5	1507 (3. Huber	collect	ed over 2	excavation	Sample 5	1508 L. L	ach col	lected ov	er 2 exc	avatior	1									
days 12/5/	/11 &	12/6/11				days 12/5	/11 & 12	/6/11													
12/5/11	8:30a	m-10:10	am = 1	00 min		12/5/11	8:30am-	10:10an	n = 100 ı	min											
12/6/11	8:25a	ım-12:00	pm = 2	15 min		12/6/11	8:25am-	12:00pn	ก = 215 เ	min											

^{***}Note: Samples are analyzed after 4 days to allow for radon / thoron progeny decay

Occupational Dose Limit for Occupational Radiation Exposure = 5 rem Total Effective Dose Equivalent 2000 DAC-Hours = 5 rem

DAC (Derived Air Concentration) for Th-232 = 5E-13uCi/ml

Administrative Site Limit for Occupational Exposure = 30% Th-232 DAC = 1.5E-13 uCi/ml

Appendix I

Instrument Calibrations

page 1 of 2

Model 2221 serial numb	oer:	14	
Probe 44-10 serial numb	ber: <u>PR 098196</u>		
Date:	10	,	
		*	
Scaler Linear Check			
Pulser model/serial num	nber: <u>Ludlum 5</u>	001 142038	÷
Calibration Due Date:	11/23/10		
Threshold set to	100 mv6H	(tech. init.)	
Pulser setting in cts.	Multiplyer	As Found Scaler reading in cts.	After Adjustment Scaler reading In cts.
400	X1	399	
44	X10	3993	-
40 K	X100	39995	
4004	X1000	399164	
Voltage Plateau Source isotope/serial nu BKGD P			RCE PLATEAU
volts	counts / Sty	volts	counts
700	17558 1044		31659 4656
750	226/6 1911	1150	3/875 4485
800	26068 2925	1200	32179 4855
850	28560 3746	• • • • • • • • • • • • • • • • • • •	
900	30023 4255		_
950	30987 4441		-
* 1000	31346 4686	***	
1050	31917 4592		· .
£			2
perating voltage selecte	ed:/000 V		6
The second secon			

page 2 of 2

Model 2221 serial number:

176944

Probe 44-10 serial number:

PR 098196

Date:



window verified at about 3830

Instrument BKGD

1 minute BKDG counts

5648

5658

5672

5693

Average: _____5672

Source Block Data

Source block ID:

1 minute Source Block counts

24478

24339

24338

24246

23879

24089

Average: 24228

Activity Calculation

Net Average source count rate of: __________ cpm

divided by 10 = 1855-6

Times 7.2 =

13174.8___(A)

Square root of (A) = 1/4.8 times 2 = 2.29.6 (B)

Calibration performed by:

DATE: 11/8/10 .

Calibration approved by:

DATE:

page 2 of 2

Model 2221 serial number:

176944

Probe 44-10 serial number:

PR 098196

Date:

11/8/10

window verified at about 3830

Instrument BKGD

1 minute BKDG counts

1450

Average: ______ /428

Source Block Data

Source block ID: 2012 - 54 - 274 2012 - 54 - 47A

1 minute Source Block counts

9158

9167

8809

8920

Average: 9070 cpm Net Average: 7642 cpm

Activity Calculation

Net Average source count rate of: 7642 cpm

divided by 10 = 764. 2

Times $\frac{7.7}{7.2}$ =

5425.8 (A)

Square root of (A) = 73.66 times 2 = 147.3 (B)

(A) plus the average BKGD = 6853.8 CPM/7.2 pCi

The cutoff value is: 6707 (CPM/7.2 pCi minus (B))

Calibration performed by:

DATE: 1/8/10

Calibration approved by:

DATE:

page 1 of 2

176944 Model 2221 serial number: 44-62 Probe 44-10-serial number: PR 294074 11/8/10 Date: Scaler Linear Check Pulser model/serial number: Ludlum 500 Calibration Due Date: Threshold set to 100 mv. ____ 6 // (tech. init.) As Found After Adjustment Scaler reading in cts. Scaler reading in cts. Pulser setting in cts. Multiplyer 400 399 **X1** 4k 3993 X10 40K 39995 X100 400K 399164 X1000 Voltage Plateau C5-137 0.89.C #4830 Source isotope/serial number: 00 /2/40/95 / **BKGD PLATEAU SOURCE PLATEAU** counts / counts counts / courts volts volts 800 400 13519 1096 1975 97 850 450 267 47281 3530 3244 500 900 3/7 11857 3232 120208 950 550 3301 318 38345 192602 600 1000 3439 64348 348 229958 650 3354 315 700 369 3511 750 4679 465 operating voltage selected: ____600 V

Date:

November 8, 2010

Performed By:

Glenn Huber

Ludium Model 2221

S/N 176944

Ludlum Model 44-62

S/N PR294074

IMPORTANT NOTE: HV must be set to 600V prior to using. Currently set at 1000V for Model 44-10 2"x2" NaI detector

Thorium Downhole Data

CD-1	1.7 pCi/g
CD-8	12.9 pCi/g
CD-7	23.4 pCi/g

DRUM	Avg CPM
CD-1	1355
CD-8	6262
CD-7	10890

page 1 of 2

Model 2221 serial number			*
Probe 44-10 serial number	098196		
Date:	-	8	
Ocalina Lincon Olebah			
Scaler Linear Check	1 11 500	# 159.07	
Pulser model/serial number	a 6	1 1 13 170 1	
Calibration Due Date:	1/27/12		
Threshold set to 10	00 mv	(tech. init.)	
Pulser setting in cts.	Multiplyer	As Found Scaler reading in cts.	After Adjustment Scaler reading in cts.
400	X1	400	_
41	X10	3999	
40 K	X100	39894	
400 k	X1000	399876	
Voltage Plateau Source isotope/serial numb	CS-/37 0.894C* Der: on va/20/95	# 48 30	
BKGD PLA			RCE PLATEAU
volts	counts / 8kg	volts	counts/ co-45 33/88 4627
>50	23/81 /593	1150	33390 4615
800	26923 2513	1200	<u>34837-</u> 4727
850	29423 3034		
900	31175 3806		
950	32027 3870		
* 1000	32881 4337	1940	
1050	C 11.12		
	33190 4687		
perating voltage selected:			

Ludlum	Model	2221/44-10	Calibration

page 2 of 2

Model	2221	serial	num	ber:
-------	------	--------	-----	------

176944

Probe 44-10 serial number:

098196

Date: ///8/11

window verified at about 3830

Instrument BKGD

1 minute BKDG counts

7413

7084

6804

7066

7050

Source Block Data

Source block ID: 2014

1 minute Source Block counts

25282

25696

25452

25477

25742

25675

Average: __ 25554 __ cpm

Net Average: ______ /8470,5 ____ cpm .

Activity Calculation

Net Average source count rate of: 18470.5 cpm

divided by 10 = 1847.05

Times $\frac{7.7}{7.2}$ =

13114.05 (A)

Square root of (A) = 1/4-5 times 2 = 29.0 (B)

(A) plus the average BKGD = 20/9 > .6 CPM/7.2 pCi

Calibration performed by:

Calibration approved by:

page 2 of 2

Model 2221 serial number:

176944

Probe 44-10 serial number:

098196

Date:

11/8/11

window verified at about 3830

Instrument BKGD

1 minute BKDG counts

2123 2137

2083

9933

Average: ______2//9.7

Source Block Data

Source block ID: 2014 -57174

1 minute Source Block counts

9213

9732

9506

9049

9438

9307

Average: 9374,2 cpm Net Average: 7254,5 cpm

Activity Calculation

Net Average source count rate of: ______ cpm

divided by 10 = > 25.45

Times 72 =

5150.7 (A)

Square root of (A) = $\frac{71.8}{}$ times 2 = $\frac{143.6}{}$ (B)

(A) plus the average BKGD = >270.4 CPM/7.2 pCi

The cutoff value is: /

(CPM/7-2 pCi minus (B))

Calibration performed by:

DATE: ///s/1/

Calibration approved by:

DATE:

MAGINITION AND THE TO GAILWIGHT	Ludlum	Model	2221/44-10	Calibration
---------------------------------	--------	-------	------------	-------------

page 2 of 2

Model 2221 serial number:	76944
Probe 44-10 serial number:	98196
Date: ///8/1/	window verified at about 3830
Instrument BKGD	
1 minute BKDG counts	AT I I I TO THE PART OF THE PA
2437	2528
2521	2491
2439	2456
Average:	
Avoidgo:	
Source Block Data	WILSS - V10C
1 minute Source Block counts	Source block ID: 23/A - SYNTA
	10894
/ 623	7093
	09//
Average: <u>/0859.5</u> cpm	Net Average: 8380.8 cpm
Activity Calculation	
	of: 8380.8 cpm divided by $10 = 838.08$
Times 7.2 = 5950.4	<u>∕</u> (A)
Square root of (A) =	times 2 =(B)
	5/
(A) plus the average BKGD = 84	
The cutoff value is:	
I Unstiched =/ 25	
Calibration performed by:	DATE: 1/8/1/
Calibration approved by:	DATE:

page 1 of 2

Model 2221 serial number	176944		¥
Probe 44-10 serial number	098/96		
Date: ///9//2			
Scaler Linear Check			
Pulser model/serial number	er: _ Ludlum 500	1 # 142038	
Calibration Due Date:	11/22/12	· *** ********************************	
Threshold set to 10	0 mv <i>GAH</i>	(tech. init.)	A 77 A 17 1 1
Pulser setting in cts.	Multiplyer	As Found Scaler reading in cts.	After Adjustment Scaler reading in cts.
400	X1	400	
4k	X10	4001	-
Yok	X100	40012	
400 K	X1000	400128	_
Voltage Plateau		9	
Source isotope/serial numb	0.89 u.C. 0.89 u.C.	# 4830	
BKGD PLA	TEAU (3056C.)	SOUF	RCE PLATEAU
volts	counts / courts 15074 658	volts	29601 3649
750	21107 /051	1150	29827 3792
800	24034 1565	/200	30465 3617
850	26151 2224	Marie Called Control of Control	
900	27309 2768	· PALL	
950	27889 3/35		
1000	28887 3/37		
1050	29364 3830		
perating voltage selected:	1000 V	8	
5			

Ludium Wodel 2221/44-10 Calibration	page 2 of 2
Model 2221 serial number: /76944	
Probe 44-10 serial number:	
*	
Date: //9//a window verified at about 3830	e.
Instrument BKGD	
1 minute BKDG counts	.~ .~
4606 4756	
4914 5019	
4867 4800	
Average:4827	
Source Block Data 20/2 - 54/7A 20/2 - 54/27A 20/2 - 54/	
23369 23636	
23442 23799	
23727 23580	00
Average: 23593 cpm Net Average: 18766 cpm	
Activity Calculation Net Average source count rate of: 18766 cpm divided by $10 = 1876$. Times $\frac{7.7}{7.2} = 18323$, $\frac{96}{6}$ (A) Square root of (A) = 115.43 times $2 = 230.86$ (B) (A) plus the average BKGD = 1850.96 CPM/ 7.2 pCi The cutoff value is: 17.920 (CPM/ 7.2 pCi minus (B))	6_
Unskielded	
Calibration performed by:	110

Calibration approved by:

DATE:

DATE:

Ludlum Model 2221/44-10 Calibration

page 2 of 2

	page 2 or
Model 2221 serial number: /76944	
Probe 44-10 serial number: 098/96	
*	
Date: /// 9/12 window verified at about 3830	
Instrument BKGD	
1 minute BKDG counts	.50
1408 1462	
1442 1572	
1583 1283	
Average:	
Source Block Data 2012 - 5417A 2012 - 5427A 2012 - 5437A Source block ID: 2012 - 5447A	
1 minute Source Block counts	
8659 8722	
8735 8752	
8507 8557	8
Average: 8655 cpm Net Average: 7/97 cpm	
Activity Calculation	
Net Average source count rate of: $\frac{7/97}{\text{cpm}}$ cpm divided by $10 = \frac{7/9}{\text{cpm}}$	7_
Times $\frac{7.7}{7.2} = \frac{5/09.87}{}$ (A)	
Square root of (A) = $\frac{71.48}{}$ times 2 = $\frac{142.96}{}$ (B)	
(A) plus the average BKGD = 6563.87 CPM/ 7.2 pCi	
The cutoff value is: 6425 (CPM /7.2 pCi minus (B))	
Calibration performed by: DATE: DATE:	/12

Calibration approved by:

Long Cord

Ludlum Model 2221/44-10 Calibration

page 2 of 2

Model 2221 Serial number: / 76 944
Probe 44-10 serial number: 098/96
Date: ///9//- window verified at about 3830
Instrument BKGD
1 minute BKDG counts
1415 1365
1374 1485
1413 1351
Average:
Source Block Data Source block ID: 2012 - 5437A Source block ID: 2012 - 5447A 1 minute Source Block counts
9088 9328
9/86 9230
9127 9213
Average: 9/95 cpm Net Average: 7689 cpm
Activity Calculation
Net Average source count rate of: 7689 cpm divided by 10 = 768.9
Times $\frac{7.7}{7.2} = \frac{5459.19}{}$ (A)
Square root of (A) = $\frac{73.89}{}$ times 2 = $\frac{/47.78}{}$ (B)
(A) plus the average BKGD = $\frac{6865.19}{\text{CPM/7.2}}$ pCi
The cutoff value is: 6717 (CPM/7.2 pCi minus (B))
Calibration performed by: DATE: 11/9/12
Calibration approved by: DATE:

Appendix J

Training Signature Sheet

Training Attendance Sheet

Title: Basic Radiation Safety Date: 9/12/1/8AM	
Instructor: Steve Kornder/Gle	nn Hober
Format: Lecture face to face to the	riler 515 Peshtigo Ca
Print Name	Signature
Steve Konder	At Kind
BRIAN Soum, OT	B
Glenn Huser	Off
Jason Samolinski	A Beef
LUKASI LACH	Junter Gree
MAREK GWOZDZ	man
Vernetz Simon	Vernets Simon
Mist BARINGS	had
	•
	J.

Appendix K

Right-Of-Way Field Sketches

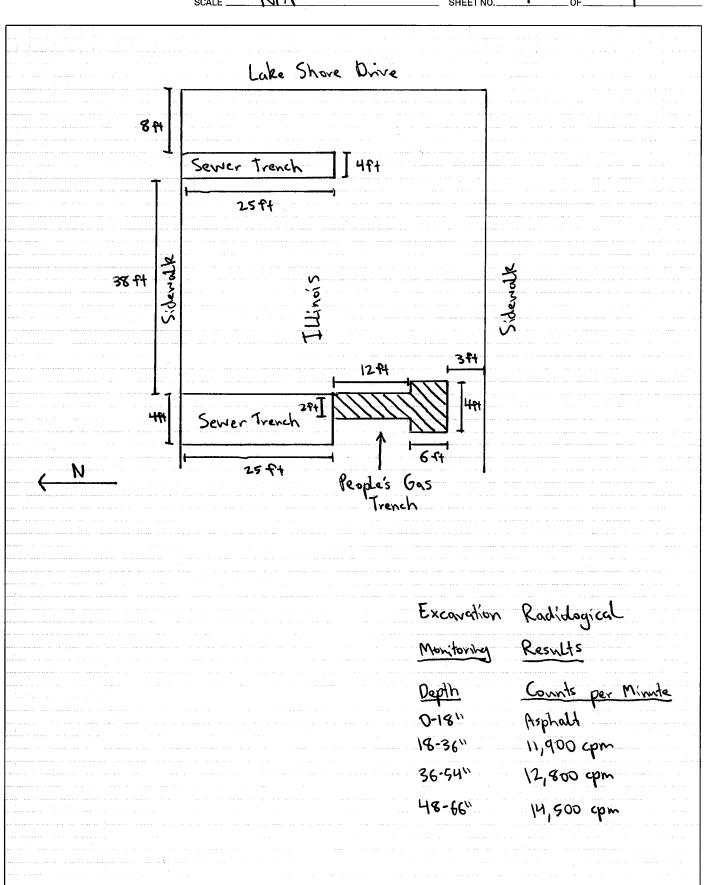


JOB TITLE 520 E 114 NO S

JOB NO. 60157647 CALCULATION NO. DATE 111511

REVIEWER JOR DATE 121411

SCALE NIA SHEET NO. 0F



Grid: 6x6 = 2 cm



AECOM 303 E. Wacker Drive, Suite 900 Chicago, Illinois 60601 312-938-0300 tel 312-938-1109 fax

February 7, 2012

Mr. Willie Thomas Commonwealth Edison Senior Environmental Coordinator Three Lincoln Centre, 3rd Floor Oakbrook Terrace, IL 60181

RE: Radiological Survey of Right-of-Way Utility Excavation

Permit Address: 515 N. Peshtigo Court

AECOM Project No. 60219374

Dear Mr. Thomas:

Pursuant to conditions specified in a permit (see attached) issued by the City of Chicago, radiation monitoring was required to be performed at the above referenced site. AECOM Technical Services, Inc. (AECOM) provided the required radiation monitoring between the days of January 30, 2012 and February 2, 2012 for an excavation to install an electrical service package.

Surveying was conducted in 18-inch lifts for soils removed from a 3-foot wide by 26-foot long excavation to a depth of 52-inches in the Right of Way and a 5-foot wide by 8-foot long excavation to a depth of 52-inches underneath an existing sidewalk (See Sketch), required for the installation of an electrical service package. The monitoring revealed no indication of soils above the specified clean-up threshold established by the U.S. Environmental Protection Agency (USEPA) for the Streeterville area of Chicago. The USEPA threshold for Chicago's Streeterville area is 7.1 picocuries per gram (pCi/g total radium (Ra-226 + Ra-228).

Gamma radiation count measurements for the project were made using a Ludlum Model 2221 survey meter and an unshielded 2 x 2 Nal probe (Model 44-10). For the instrument used, the gamma count indicative of the 7.1 pCi/g threshold was 19,969 counts per minute (cpm) unshielded (7,127 cpm shielded). The field gamma background for the area was measured at approximately 5,000 cpm unshielded. The field gamma measurements within the excavation and the spoil materials generated during the excavation process did not exceed the respective threshold values previously stated and ranged from a minimum of 5,100 cpm to a maximum of 12,000 cpm unshielded. Thus, there was no indication of the presence of radiologically-contaminated material and/or an exceedance of the USEPA cleanup threshold of 7.1 pCi/g total radium.

As part of the permit conditions this letter has been forwarded to:

Chicago Department of Environment Attention: Ms. Rahmat Begum 30 North LaSalle Street, 2nd Floor

Chicago, Illinois 60602

Please contact us with any questions you have regarding this letter or the reported results.

Regards,

Brian R. Schmidt Project Scientist II Steven C. Kornder, Ph.D. Senior Project Geoscientist

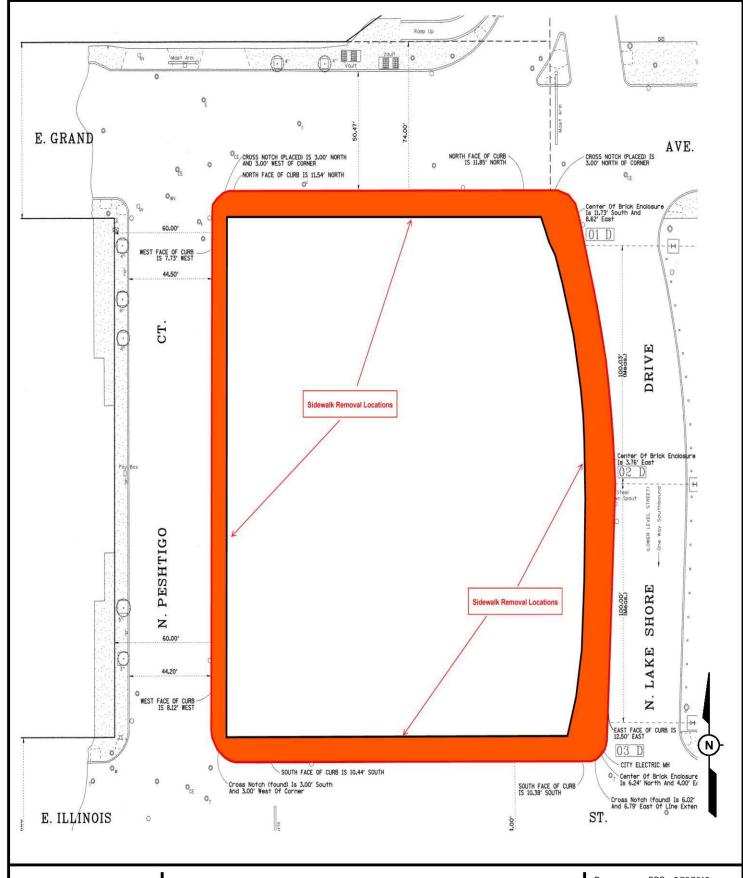
cc: Rahmat Begum, Chicago Department of Environment

Verneta Simon, USEPA

Attachments: Permit

Sketch

Calculation Sheet Project Subject CDOT - 515 N. PESUTIGO CT ROW RADIOLOGICAL SOIL Originated By Date /30/12 Checked By Date 3/30/12 STS Job No. Of _ Sheet No. 60240639 NA AVE. ILLINOIS STREET CURS STLE ET CURS 25' 50. CPM DEPTY 0-18" 6,000 8,000 13-36" 6' CPM DEPTY 0-6" CONGACTE 16' 6-24" 13,700 24-42" 17,600 (PAVERS) 36-54" 16,400 (6") 120 CPM DEPTH 0-6" CONCLETE 8,200 6-24" 13,300 24-42" 42-60" 15,400 60-78" 14,300 5 DEPTY CPM 0-6" CONCLETE 6-24" 11,200 24-42" 13,900 42-60" 60-78" 8,300 8,600 72-90"



AECOM

AECOM

750 Corporate Woods Parkway Vernon Hills, IL 60061 847-279-2500 www.aecom.com 516 NORTH LAKE SHORE DRIVE CHICAGO, IL

SIDEWALK REMOVAL LOCATION MAP

Drawn:	BRS 5/22/2013	
Checked:	STK 5/22/2013	
Approved:	STK 5/22/2013	
PROJECT NUMBER	60219374	
FIGURE NUMBER	-	